IDG.net

Wireless will rule, but not the way you think. PAGE 36 · IT must identify technology's impact, warns Peter G.W. Keen. PAGE 34

COMPUTERWORLD

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MAY 14, 2001 • VOL. 35 • NO. 20 • 55 ED[illegible]

MICROSOFT ALTERS LICENSE, UPGRADE PLANS

Users get subscription option, but loss of version-upgrade program could cost them

BY CAROL SLIWA AND TODD R. WEISS

The changes to its volume software licensing and upgrade programs that Microsoft Corp. announced last week will motivate many enterprise customers to re-evaluate their existing agreements, since part of the new plan could mean cost increases for some firms, analysts predicted.

Saying it wants to offer customers more choices, Microsoft took initial steps toward licensing software as a service, unveiling a subscription-based option that will allow customers who hold enterprise agreements to rent software for fixed periods of time, starting Oct. 1.

Enterprise agreements will be open to more companies than they are now, since the number of PCs a company needs in order to qualify will be reduced from 500 to 250.

"I can see they need to increase revenue, since [operating system] sales have flat-

Licensing, page 73

Microsoft's Volume Licensing Programs

CURRENT	EFFECTIVE OCT. 1
Open Agreement: Five-license minimum, two-year term	**Open Agreement:** No change
Select Agreement: 250-license minimum (approximate), two-year term	**Select Agreement:** 250-license minimum, three-year term
Enterprise Agreement: 500-license minimum, three-year term	**Enterprise Agreement:** 250-license minimum, three-year term for standard set of Microsoft products on all PCs
	Enterprise Agreement Subscription: This new option allows customers with enterprise agreements to rent software for a fixed time period in the same way they currently lease computer hardware. The cost is about 15% less per year than a new enterprise agreement.

Francis Dramis
BellSouth
$5.5M

Dawn Lepore
Schwab
$2.2M

Bruce Goodman
Humana
$1.8M

MAJOR-LEAGUE CIOS

How do they know they've made it big? When they influence the CEO, get eye-popping bonuses and show up in the annual proxy statement as one of the company's four or five highest-paid corporate officers. Kim S. Nash examined the Fortune 1,000's proxies and found that only 46 of their CIOs hit the jackpot.

The special report, with a top-25 compensation chart, begins on page 42.

USERS MOLD SECURITY BENCHMARK

Group develops standard for Solaris

BY PATRICK THIBODEAU

The problem with IT security benchmarks is that the reference point is a constantly shifting target as new technologies and threats emerge.

And that's an especially difficult problem to overcome, said corporate security systems managers. They are examining the fruits of a relatively new cooperative effort that this week will yield the near-final version of a systems security benchmark for Sun Microsystems Inc.'s Solaris.

But despite concern about the benchmark's continued usefulness, end-user members of the Center for Internet Security said the organization's technical benchmark for securing Solaris systems will be key to their security efforts.

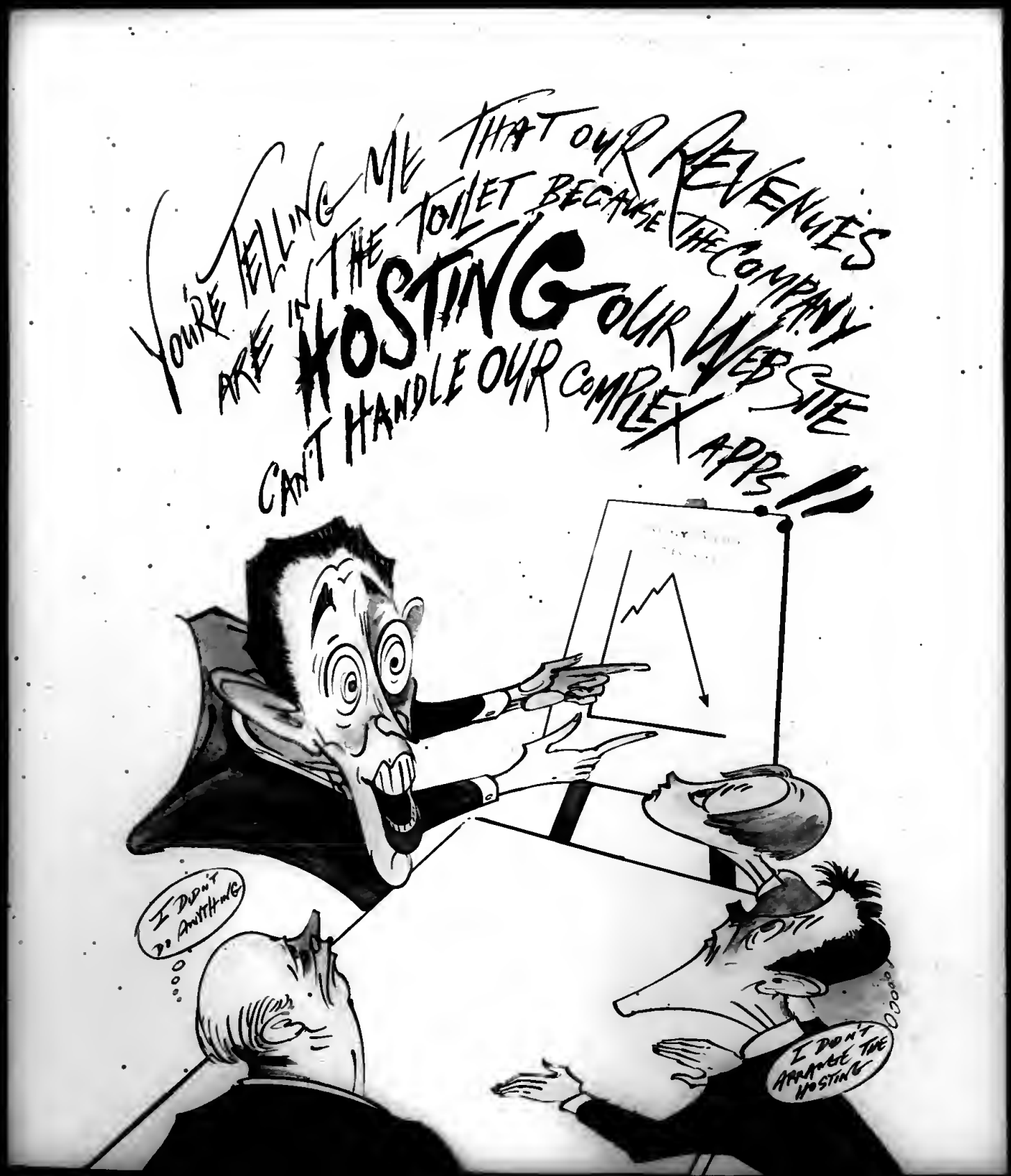
"To me, this is a great economic package for us," said Iris Patton, who heads security for the Americas at Houston-based Shell Services International Inc., the IT unit of Royal Dutch/Shell Group. In return for the $5,000 membership fee the company paid to the CIS, it's receiving technical information that's good enough to serve as a substitute for high-priced consultants, she said.

The CIS is a nonprofit, cooperative group in Bethesda, Md., that was formed last October. Its members include more than 140 companies, government agencies and consulting firms.

The benchmark outlines a list of specific operational actions and settings for securing systems at different levels of protection. It

Solaris, page 16

NEWSPAPER


YOU'RE TELLING ME THAT OUR REVENUES ARE IN THE TOILET BECAUSE THE COMPANY HOSTING OUR WEB SITE CAN'T HANDLE OUR COMPLEX APPS!!
I DIDN'T DO ANYTHING
I DON'T ARRANGE THE HOSTING

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THE TOP CERTIFICATIONS

Having the right technical certifications on your résumé can be the key to better jobs, projects and pay. The right one for you may depend on where you are in your career and which ones you already have. But here's a look at some top certifications with which you definitely won't go wrong. **PAGE 63**

STREAMING INTO THE ENTERPRISE

Companies that are delivering video and audio streaming content over the Web or internal networks say the process is valuable, if you understand the technology's limitations. **PAGE 58**

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42 CIO salaries show that a large percentage of Fortune 1,000 firms still don't recognize IT as a core function.

MORE ONLINE For breaking news, updated twice daily at noon and 5 p.m., visit our Web site. **www.computerworld.com/latestnews**

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ONLINE

WHO EARNS WHAT?

You'll find an expanded chart of CIO salaries to accompany our "Major-League CIO" special report. **www.computerworld.com/ciosalaries**

PALM OS OR WINDOWS CE?

Which PDA standard will integrate best into your IT infrastructure? Larry Mittag, CTO at mobile systems integrator Stellcom, walks through the differences between the Palm OS and Windows CE, and hosts a forum on mobile devices in the enterprise. **www.computerworld.com/community/os**

GADGET ENVY

Sitting in a restaurant with a friend, Gadget Guy was suddenly overcome with gadget envy — his friend's cell phone was better than his. Find out what he did about it. **www.computerworld.com/wireless**

HOW TO GET THE GO-AHEAD

After reading the *ROI* supplement that comes with this issue, head to our *ROI* Web site for online-only features such as "Getting the Green Light," which details how to use business payback scenarios to secure approval and money for new e-business projects. **www.computerworld.com/roi**

AT DEADLINE

Report: Mobile Commerce Bombs

Less than 1% of mobile phone subscribers used their cell phones to make a purchase in the past year, according to a report by Chicago-based consulting firm A.T. Kearney Inc. The report added that only 3% of U.S. mobile phone users plan to execute a mobile commerce transaction in the next year, down from the 34% who said in last year's survey that they intended to make such purchases. The report cited slow data rates, small screens and awkward keyboards.

Sara Lee Strikes E-Commerce Deal

Sara Lee Corp. in Chicago last week announced plans to outsource 80% of its European purchasing activity during the next 18 months to Jenkintown, Pa.-based ICG Commerce Inc. The e-commerce deal covers a total of $800 million in purchases and focuses on indirect items such as office equipment, cargo transportation and telecommunications.

Nortel to Exit DSL, Searches for CEO

Nortel Networks Corp. said Friday that it's looking for a successor to replace its CEO, who will retire next year, and that effective immediately, its chief operating officer has quit for health reasons. Brampton, Ontario-based Nortel also announced that it will exit the Digital Subscriber Line business to concentrate on higher-growth markets.

Compaq Backs Off

Two weeks after announcing that it would acquire Proxicom Inc. for $280 million, Compaq Computer Corp. on Friday said it won't match a higher offer made by a competing bidder for the Reston, Va.-based e-business consulting firm. The higher bidder was South Africa-based Dimension Data Holdings PLC.

Rival Routing Protocol Takes on Frame Relay

Global One says superior QOS and cost savings will drive migration to MPLS

BY JAMES COPE
LAS VEGAS

FRAME RELAY may be one of the most widely accepted ways of linking geographically dispersed corporate locations, but Multiprotocol Label Switching (MPLS) — a no-nonsense, high-speed routing protocol — may be a technology whose time has come, thanks to better quality of service (QOS) and lower implementation costs.

Paris-based Global One is one major proponent of MPLS for worldwide wide-area network connections. Last week, the telecommunications service provider announced that it had flipped the switch on a new data center in Reston, Va., that provides a virtual private network (VPN) over MPLS service.

Andi Wethli, CIO at manufacturer Sia Abrasives Holdings AG in Frauenfeld, Switzerland, said his company has chosen Global One's MPLS VPN service to connect sites in 10 countries.

What Is It?

MPLS is a specification from the International Engineering Task Force that enables routers at the edge of networks to read special tags on IP packets. That bypasses destination lookup in routers at the core of a network, which, according to industry officials, helps speed routing and also affords QOS at levels that can support a wide variety of network traffic, including video.

Wethli's selection criteria included global access to the carrier's network, VPN services and a single network that could handle voice and data. He said his company is running enterprise resource planning applications, some legacy productoo systems, corporate e-mail and voice telephone traffic over the network.

According to at least one analyst, QOS in MPLS networks is superior to that of frame relay. Jim Slaby, an analyst at Cambridge, Mass.-based Giga Information Group Inc., said he expects to see a "wave of deployment" of MPLS-based networks during the next two to three years. Slaby said that's because MPLS is cheaper for service providers to set up, manage and maintain than frame relay and therefore costs companies 10% less to install and run than frame services. WorldCom Inc. is also moving toward providing MPLS service, Slaby added.

Global One's main service offering is still frame relay, noted Executive Vice President Detlef Spang. Still, he said, he expects more of Global One's existing corporate customers to migrate to MPLS VPNs.

Global One, which is owned by France Telecom ADS in Paris, is in the process of merging with Amsterdam-based service provider Equant NV. Spang said the merger should be completed by July.

France Telecom will retain a 54% share in the new entity, Spang said. The name of the new company has yet to be determined.

SIA ABRASIVES CIO ANDI WETHLI chose Global One's MPLS service because its VPN could handle voice and data.

Cisco to Support Next IP

IPv6 designed to far exceed IPv4's 4 billion addresses

BY JAMES COPE

Addressing the prospect that the world may run out of public Internet addresses, Cisco Systems Inc. told *Computerworld* last week that the next iteration of its Internetworking Operating System (IOS), due this month, will support IP Version 6.

IPv6, based on a 128-bit address structure, has been under development since the mid-1990s by a group within the Internet Engineering Task Force. It's designed to break through the 4 billion-address ceiling of the 32-bit IPv4.

Using IPv6, the number of public Internet addresses is, for all practical purposes, infinite, according to Steve Deering, Cisco's engineering vice president.

John Crain, technical director at the Internet Corporation for Assigned Names and Numbers (ICANN) in Marina Del Rey, Calif., said there's no immediate danger of depleting the current pool of IPv4 addresses. He added that ICANN, which oversees the naming authorities responsible for handing out IP addresses, has 100 unallocated blocks on hand, each with 16,777,216 individual addresses.

Still, there's a wild card: wireless. The third generation of mobile phones, sometimes referred to as 3G, works best when each phone has its own public IP address. And it's not a stretch to imagine sales of a few billion phones and other wireless devices that could use up existing IPv4 addresses.

ROBERT ZAMAN/KNIGHT-RIDDER/TRIBUNE

Most large corporate users aren't concerned, though.

Officials at Ameritrade Holding Corp. in Omaha, for example, said that the online brokerage company is monitoring developments in IPv6 but that the company has no plans to begin a formal evaluation of the new protocol set.

Scott Marcus, chief technology officer at Genuity Inc. in Woburn, Mass., said some recent studies he has been involved with indicate there will be plenty of IPv4 addresses at least through 2010.

Stan Schatt, an analyst at Giga Information Group Inc. in Cambridge, Mass., said that although IPv4 and IPv6 aren't directly interoperable, they can coexist on the Internet. Software upgrades to existing routers, Schatt explained, can give them the ability to recognize and route both protocols.

IPv6 traffic can't run native over the IPv4 Internet and vice versa, Deering said. But IPv6 packets can traverse the existing Internet by tunneling through IPv4.

Microsoft: Don't Stop Windows 2000 Rollouts to Wait for XP

Analyst likens new XP features to Service Pack release for Windows 2000

BY CAROL BLIWA

Microsoft Corp. last week announced plans to release its promised Windows XP desktop operating system to users in October. But companies now rolling out Windows 2000 shouldn't worry about doing an immediate upgrade to XP, Microsoft officials said.

Jim Allchin, group vice president for operating system platforms at the software vendor, said during a teleconference that he wouldn't suggest tabling Windows 2000 desktop projects in order to wait for the shipment of Windows XP, which will be released as different versions for business and home users.

Companies could move to XP later, if they're "in the middle of a [Windows 2000 installation] when Windows XP is launched," Allchin said. "But if they've already rolled out Windows 2000, I think they've got a great system there."

Analyst Mike Silver at Gartner Inc. in Stamford, Conn., said companies that don't plan to install the desktop version of Windows 2000 until next year might want to go directly to Windows XP instead.

"If they're in the midst of planning to bring in new machines later this year with Windows 2000, we say, 'Go ahead,'" Silver said. "If they haven't started planning [by] the third or fourth quarter of this year, then they have to consider whether they should wait for XP."

Many corporate users usually bypass the initial version of a new Windows release and wait for Microsoft's first Service Pack update, which addresses any bugs or other problems. But Silver said that shouldn't be a concern with XP. "We don't consider XP the first version," he said. "We consider it basically as a Service Pack with a few new features [added] to Windows 2000."

Planned Windows XP features geared toward businesses include a mode that lets applications designed for earlier versions of Windows run on XP, and a tool that lets wireless users gain automatic access to other networks.

JUST THE FACTS

The Newest Windows

What: Official release of Windows XP, the newest Windows desktop operating system

When: Oct. 25

Should you upgrade? If you're on Windows 95 or 98, Microsoft says yes. If you're on Windows 2000, you can wait.

MORE THIS ISSUE
More Windows 2000 news on page 12.

OmniSky Ups Rates for Compaq iPaq Users

Usage-based pricing could affect sales

BY BOB BREWIN

Saying users of Compaq Computer Corp.'s iPaq Pocket PC use more airtime, wireless services provider OmniSky Corp. is charging iPaq users $20 per month more than it charges users of other handheld devices.

IPaq users will have to pay the premium for unlimited airtime on the nationwide cellular packet data network operated by San Francisco-based OmniSky because beta tests showed that they logged on more often and spent more time online than users of Hewlett-Packard Co.'s Jornada Pocket PC, Palm Inc.'s Palm V or handhelds from Handspring Inc., said Amanda Higgins, an OmniSky spokeswoman. She declined to detail the amount of airtime used by iPaq users.

OmniSky will charge Compaq users $59.95 per month for airtime, compared with $39.95 per month for users of the Palm V, Handspring handhelds and the Jornada.

OmniSky, which introduced its service for the iPaq last week, determined in its beta test "that iPaq users use a lot more airtime than Palm or Jornada users ... and we have to set our pricing policy around airtime used," Higgins said.

Alan Reiter, an analyst at Wireless Internet & Mobile Computing in Chevy Chase, Md., said the disparity in pricing for wireless service established by OmniSky could influence corporate purchasing decisions.

"This is an unnecessary discrimination of iPaq users," Reiter said. "Corporate IT managers could get irritated at having to pay a higher price for the same kind of service," depending on which handheld device was purchased, he said.

Nora Hahn, a spokeswoman for Compaq, said iPaq users can subscribe for $39.95 to Compaq's iPaq Net service, which is equivalent to the service offered by OmniSky. IPaq Net is supplied by GoAmerica Communications Inc. in Hackensack, N.J., Hahn said. She added that since OmniSky is a separate company, Compaq has nothing to do with its pricing decisions.

Higgins said OmniSky is running an introductory offer through June 30 that bundles the hardware — an iPaq and a modem — along with a year's worth of airtime for $699. "You esseotially get the hardware for free," she said.

MORE ONLINE
For more information on wireless, visit the community on our Web site.
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Wild Wireless Pricing

- OmniSky plans to charge Compaq iPaq Pocket PC users a **$20 airtime premium** because, it says, iPaq users soak up more airtime than HP or Palm users.
- Palm and HP users **pay $39.95 per month**, vs. $59.95 for iPaq users on OmniSky.
- Compaq offers a similar but lower-priced service through its **iPaq Net** provided by GoAmerica.

IBM Brings Software Under Single E-Business Umbrella

BY JAIKUMAR VIJAYAN

IBM today is launching an e-business initiative aimed at helping users dynamically connect multiple enterprise applications and systems using a standards-based Web services architecture, said sources familiar with the announcement.

The effort is said to encompass all four of IBM's major software technologies below the operating system level: its WebSphere application server and DB2 database, plus subsidiary Tivoli Systems Inc.'s management tools and the groupware and collaboration products made by IBM's Lotus Development Corp. unit.

As part of the initiative, the sources said, IBM will develop tools and software components that are supposed to let the different technologies interact with one another more efficiently. IBM declined to comment on the announcement, which is taking place today at an event in New York.

"It sounds like IBM is building components that link applications together dynamically," said Sam Albert, president of Sam Albert Associates Inc. in Scarsdale, N.Y. "This is an appreciation by IBM of how [interoperable] e-business software portfolios need to be."

Among the products expected to be announced are WebSphere Studio tools for Web services application development and a WebSphere Business Integrator, which will provide integration, transaction and workflow services between applications and enterprises.

The products are scheduled to start shipping later this quarter and will incorporate support for standards like Simple Object Access Protocol; Universal Description, Discovery and Integration; and Web Services Description Language.

Also being announced is a Lotus Web services enablement kit for building Web services. The tools will become available in the second half of this year and will include a Lotus knowledge-discovery management module.

Meanwhile, a DB2 XML Extender will bring Web services to IBM's relational database software technology. The technology has already been integrated into IBM's recently announced DB2 Version 7.2; it will enable Web services to access data, regardless of vendor platform.

IBM declined to comment on today's announcement.

Outsourcing Helps Auto Sector in Tough Times

Lean IT staffs, flexible contracts help manufacturers forge ahead with less

BY LEE COPELAND GLADWIN
DETROIT

INFORMATION technology professionals haven't been immune to the recent spate of nationwide layoffs, putting some companies' projects at risk. But IT executives from top automotive companies last week said their heavily outsourced operations have been insulated from the ax.

"The outsourced model allows us to constantly evaluate our contracts," said Ted Wozniak, senior vice president of IT for materials management at Aurora, Ontario-based Magna International Inc., an $11 billion vehicle component manufacturer.

If IT staff cuts become necessary, "it will come from people outside rather than inside," Wozniak said at the Michigan IT Summit here.

Ford Motor Co. and General Motors Corp. also rely on heavily outsourced IT operations. Both companies estimated spending about $3.2 billion last year on IT but said they plan to slightly reduce that sum this year.

"It will be a long time before we spend that much again," said Tony Scott, GM's chief technology officer. "GM has been reducing spending on IT over the last couple years," primarily through cost controls, not head-count reductions.

But that hasn't stopped the world's largest automaker from piloting a wireless laptop LAN project and a wireless construction village at the building site of its Lansing Grand River manufacturing plant in Lansing, Mich.

Scott said these types of ambitious projects are needed to help GM become more efficient at its sprawling facilities.

Peter Janak, CIO at Delphi Automotive Systems Corp., said using outsourced resources allows the $29 billion maker of auto parts to keep internal staff numbers level and forge ahead with critical IT projects.

"The growth opportunities [in IT] are zero at this point," said Janak.

Supplier Exchange Planned

Even so, the Troy, Mich.-based company is developing a supplier exchange to lower the cost of communicating production changes throughout the supply chain. Linked to Delphi's SAP enterprise resource planning and electronic data interchange systems, the portal would communicate real-time manufacturing updates to suppliers in all parts of the supply chain.

Only four of Delphi's 5,000 suppliers are participating in the 6-month-old pilot, which has cost about $200,000 to $300,000 thus far to create. Janak said he plans to either bring in additional outsourced staff to take the project into production or hand it over to a vendor such as Covisint LLC to build out. Southfield, Mich.-based Covisint is an automotive exchange launched by the Big Three automakers last year.

The portal project, which will cost between $5 million and $10 million to get into full production, could potentially reduce costs by $100 million per year by eliminating the time delays, overtime and premium freight shipment costs associated with missed production schedules, Janak said.

> The growth opportunities [in IT] are zero at this point.
>
> PETER JANAK, CIO, DELPHI AUTOMOTIVE SYSTEMS

Layoff-Proof

Major automakers say outsourcing has insulated their IT departments from cuts.

Delphi Automotive Systems, for example, has an IT staff of about 600, but CIO Peter Janak says the $29 billion manufacturer wants to outsource much of that staff.

Users Take B2B Projects One Small Step at a Time

12 users set targets in online supply chain operations

BY MICHAEL MEEHAN
NEW YORK

A down economy may have slowed the corporate charge toward a Web-based business-to-business trading world, but companies continue to invest in targeted online supply chain operations.

Speaking last week at an i2 Technologies Inc. customer show here, LeRoy Allen, an e-commerce vice president at apparel maker VF Corp., said his firm had slowed its efforts to link with other companies because it decided to prepare its own one-to-one back-end systems for an e-commerce boom.

"Sharing incorrect information or bad informatinn with our customers and suppliers just didn't seem like a good idea," Allen said.

In February, Greensboro, N.C.-based VF's jeanswear division, which includes brands such as Wrangler and Lee, went live with a reorganized supply chain that gives real-time production information concerning its 52,000 jeans stock-keeping units (SKU), 103,000 bills of materials and 980,000 orders and forecasts.

GUY MANUEL: New Web storefront is step toward full collaboration.

Most important in terms of e-commerce, Dallas-based i2 supplied a conduit through which a customer using a Web-based procurement engine, such as Buyer from Mountain View, Calif.-based Ariba Inc., can query VF's jeanswear division to get real-time information about inventory and capacity.

Allen said that linking all 500,000 of VF's SKUs, 75 distribution centers and 100 manufacturing centers into the system will take years, but he stressed the importance of a steady march forward.

"You can't do it all in one day," he said.

In fact, business-to-business office supplier Corporate Express Inc., a subsidiary of Amsterdam-based Buhrmann NV, plans to take two years to construct a new online storefront to replace the in-house model it built in 1996.

Guy Manuel, the company's North American vice president for e-business, said the new storefront will enable Broomfield, Colo.-based Corporate Express to do more of the analytical work necessary for e-commerce.

He said that using trend analysis, adapting to changing procurement needs, implementing business rules and providing real-time control over expenditures were pipe dreams when Corporate Express first built the storefront for its customers.

"We've delivered online inventory and billing, but we have to create a way to share more information with our customers, and this storefront is the first step," Manuel said.

Overall, he said, Corporate Express plans to spend more than $88.5 million on business-to-business technology.

"We're probably a couple of years away from full collaboration, but we're installing the technology that should allow us to link with multiple companies when that time arrives," Manuel said.

Kip Martin, an analyst at Stamford, Conn.-based Meta Group Inc., said business-to-business projects with definitive returns on investment are the only way to proceed.

"No one knows what the whole B2B solution is," he said. "It seems people are waking up to that and starting to figure out what they can do until that time arrives."

MORE ONLINE

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BRIEFS

IRS Goof-offs

Senate Finance Committee Chairman Chuck Grassley (R-Iowa) last week criticized Internal Revenue Service workers for goofing off at work. The evidence comes from two reports by the Tax Administration inspector general that found that in a seven-day period, slightly more than half of IRS employee Internet time was spent on personal use, including stock trading, sports activities, gambling and viewing sexually explicit content. Moreover, almost half of all incoming e-mails were for nonbusiness purposes.

HP to Sell VeriFone

Hewlett-Packard Co. signed an agreement last week to sell its VeriFone Inc. electronic payment division to merger and acquisition specialist Gores Technology Group. Los Angeles-based Gores, which will acquire the struggling HP division for an undisclosed sum, said it doesn't expect any employees to be laid off as a result. HP said it incurred a loss of $40 million in its fourth quarter last year as a result of its purchase of Santa Clara, Calif.-based VeriFone. Company officials acknowledged time that "VeriFone had been a problem" but said the bad times appear to have passed. HP discussed using VeriFone technology to turn handheld computers and mobile phones into devices that can be used for shopping.

Nortel Eyes Ethernet Over Optical Fiber

Nortel Networks Corp. in Brampton, Ontario, last week announced its strategy to use 10 Gigabit Ethernet over optical fiber to simplify network management and speed traffic between the enterprise and long-haul optical connection points. Nortel's technology is based in part on a new 10 Gigabit Ethernet interface for its 8600 Switch Router. The technology is intended to ease congestion and simplify complex systems in connecting enterprise networks to long-haul optical networks in metropolitan areas.

Switch Vendors Agree On Interoperability

Standard code lets McData, Brocade devices communicate in SANs

BY LUCAS MEARIAN

THE TWO LEADING manufacturers of Fibre Channel switch products announced last week that they have agreed on a standard code that will allow their rival products to communicate in storage-area networks (SAN).

Analysts say the move will make it easier for IT managers to tie together their legacy Fibre Channel networks to create larger and more easily controlled storage environments.

McData Corp. announced that it jointly developed the interoperability code with EMC Corp. and that it has installed the code in its director-class switch, the ED-5000, allowing it to communicate with network devices made by Brocade Communications Systems Inc.

San Jose-based Brocade commands 60% to 90% of the Fibre Channel switch marketplace, according to Cambridge, Mass.-based Giga Information Group Inc.

All ED-5000 switches shipping from Broomfield, Colo.-based McData will contain the new code.

The initiative will benefit IT managers such as Edward J. Peters, supervisor of main server support for the city of Calgary, Alberta. Peters plans to expand a SAN that was built exclusively through Brocade 2800 switches, which carry far fewer connectivity ports per device than the director-class switch McData offers. The city's SAN stores 10TB of data on 20 Unix and Windows NT servers. "It gives us some choices now," he said. "We're growing quickly and want to move into a director-class switch this year."

Like a router on the Internet, a switch directs data traffic over a SAN, which is a subnetwork dedicated to storage.

A director is a high-end switch that, unlike a switch with eight or 16 ports, has up to 64 ports and is completely redundant for increased reliability.

McData and EMC's new code has been accepted as a standard by the Fibre Channel Standards Working Group of the Internet Engineering Task Force. Brocade is part of the organization and helped develop the standard.

MOREONLINE
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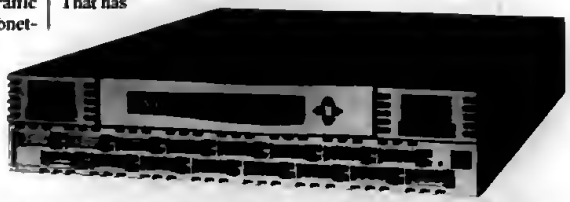
James Opfer, an analyst at Gartner Inc.'s San Jose-based Dataquest Inc. unit, said the "switch interoperability raises the bar for challenges to fibre channel's incumbency by emerging storage network technologies whose own interoperability is yet unproven."

"The big deal here is that Brocade and McData are working together, if not on a business level, on a technical one. That has historically been a challenge," said Bob Zimmerman, an analyst at Giga.

McData said the interoperability feature, dubbed E-Port, ties together Brocade's 16- and eight-port Silkworm switches, McData's ED-5000 enterprise director and EMC's Connectrix ED-1032 enterprise director and Connectrix DS-16B and DS-8B switches. EMC will also begin shipping products with the interoperability code immediately.

McData — which split off from EMC and went public in August — and Brocade each have reseller agreements with Hopkinton, Mass.-based EMC. "From the perspective of the client with multiple SANs or ones that have been built around a director-class switch rather than multiple eight- or 16-port switches, this a very nice consolidation point," said Zimmerman.

McData spokesman Steve O'Brian said his company is already conducting tests with other switch vendors and is working on additional reseller agreements.



EMC's DS16B is one of three EMC switches that will be able to interoperate with Brocade and McData devices.

But "this represents the first out of the gate and probably the most significant for the market," he said.

MORE THIS ISSUE
For more storage news, see page 24.

Visa Smart-Card Hardware Ready, but Software Isn't

Terminal software not due till year's end

BY LUCAS MEARIAN

Visa U.S.A. Inc. last week announced that the development of hardware needed for point-of-sale (POS) systems to read the embedded chip technology in its smart cards has been completed. However, the terminal software needed to read the cards won't be available until late this year.

Currently, only Foster City, Calif.-based Visa and New York-based American Express Co. are moving forward with smart cards as an alternative to credit cards.

Unlike traditional credit cards, smart cards use an embedded chip that can be programmed to accept, store and send data and is better able to stop card cloning and forgery.

When the terminal software becomes available, several key merchant payment processors will be able to offer smart-card acceptance applications on Hypercom Corp. and VeriFone Inc. terminal models. Those payment processors include Tempe, Ariz.-based Vital Processing Services and Englewood, Colo.-based First Data Merchant Services Corp.

Visa is betting that about 40% of brick-and-mortar merchants will replace their POS devices during the next four years because of outdated technology, officials said.

Theodore Iacobuzio, a senior analyst at TowerGroup, a research and consulting firm in Needham, Mass., said consumers will be quick to welcome smart cards, once the technoiogy is distributed among retailers. The sticking point until now has been that merchants will have to "foot the bill for any chip card rollout," said Iacobuzio.

THE AEROSPACE INDUSTRY IS DIFFERENT THAN THE PET FOOD INDUSTRY.

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Win 2k Management Tools Set to Debut

Microsoft, Tivoli ready to roll out products for midsize and large companies

BY SAMI LAIS

FOR MIDSIZE to large organizations, managing Windows 2000 networks should grow easier with the scheduled releases of two products.

Microsoft Corp. this week plans to release Microsoft Operations Manager (MOM) for Windows 2000. Next month, Tivoli Systems Inc. is scheduled to release Version 4.1 of its change configuration management tools for Windows 2000.

"There's a lot of commonality of purpose between the two," said Patrick Dryden, an analyst at Illuminata Inc. in Nashua, N.H. "MOM is oriented toward the tasks of operations management. It scales to handle events for thousands of servers, but it's a dumb consolidation."

The Tivoli tools "add intelligence for managing Windows systems," Dryden said. To do so, he said, "they rely on functionality Microsoft has built into the operating system and build functionality onto that, such as the event simulation engine that is built into the Tivoli change management products."

MOM 2000 will advance the use of Windows Management Instrumentation (WMI) for Windows 2000 networks, a common structure on which products from multiple vendors can be managed and can manage one another, said Winston Bumpus, president of the Portland, Ore.-based Distributed Management Task Force, the industry group that developed the standard. WMI is Microsoft's implementation of the Common Information Model (CIM) standard and the Web-based Enterprise Management architecture, of which CIM is an element.

MOM is based on management software licensed from San Jose-based NetIQ Corp. It supports the full range of Windows servers, including Microsoft Active Directory, Internet Information Server and SQL Server.

The new version of Tivoli's product — inventory, software distribution and workload tools — requires the Tivoli Enterprise Console framework and uses the CIM manager, said a spokesman for the Austin, Texas-based unit of IBM.

Tight integratino with existing tools is important to James A. Ghericich, senior technical officer at The Chase Manhattan Bank.

"The new version will automatically bring in information from the Tivoli Event Manager, something I have to do manually now," he said. "And it has hooks into WMI to let me use Microsoft's internal methods of managing the operating system."

Homepage Worm Not a Big Problem in U.S.

Smarter users, stronger defenses may have thwarted e-mail-clogging virus

BY JENNIFER DiSABATINO

End users may have finally learned about the dangers of blindly opening e-mail attachments, and systems administrators may have heeded calls to better protect their e-mail servers. Whatever the reason, security analysts said the Homepage e-mail worm that struck last week appears to have done minimal damage in the U.S.

Some antivirus software vendors have been reporting that the self-propagating worm has been responsible for sending out tens of thousands of e-mails. But analysts in the U.S. said they haven't seen a big impact from Homepage, which is the latest in a long line of Visual Basic Script (VBS) worms that target users of Microsoft Corp.'s Outlook software.

For example, the CERT Coordination Center at Carnegie Mellon University in Pittsburgh said it had received only three direct reports of users being hit by the worm. And there were only a handful of postings about Homepage in the online security discussion forums run by San Mateo, Calif.-based SecurityFocus.com Inc.

Firms that are screening and blocking .vbs files at e-mail gateways should "in effect [be] immune to this," said Eric Hemmindinger, an analyst at Aberdeen Group Inc. in Boston.

Homepage began spreading late Tuesday by luring users to open an attachment that supposedly contains a "really cool" Web page. Instead, the attachment launches one of four pornographic Web sites and then attempts to send itself to all of the users listed in a victim's Outlook address book.

"This thing really is very unoriginal," said Ryan Russell, an analyst at SecurityFocus.com.

Homepage appears to have been written with the same virus tool kit that was used to create the AnnaKournikova.jpg.vbs worm earlier this year. The Homepage worm is said to not carry destructive payloads that could damage infected computers.

The greatest threat to users is that the worm could clog corporate e-mail servers. London-based Baltimore Technologies PLC said Homepage had infected one out of every 55 e-mail messages it tracked.

JUST THE FACTS

Really Uncool

What: Homepage e-mail worm, the latest in a long line of VBS worms that target users of Microsoft's Outlook software

When: Sent around the world last week

Lure: A "really cool" Web page

Payload: Not destructive but could clog corporate e-mail servers

Defense: Screening and blocking .vbs files at e-mail gateways

IBM Features Better App Integration in DB2 Update

BY JAIKUMAR VIJAYAN

IBM is making it easier for companies that are involved in enterprise application integration efforts to tie its DB2 database software to multiple data sources and database platforms.

The company last week released a new version of DB2 that features better interoperability with its WebSphere application server, as well as with its MQSeries middleware technology.

DB2 Version 7.2 also introduces support for emerging Web service standards such as Simple Object Access Protocol and Universal Description, Discovery and Integration, and new migration tools to help users move from competing database products to DB2, according to IBM.

The release builds on IBM's efforts to help users access and integrate data from the widest variety of data sources possible, including other databases, said Brant B. Davison, a program manager at IBM's Data Management Solutions group.

The latest iteration of DB2 also builds on IBM's effort to use its messaging and application server technologies for transporting real-time data from operational databases to various applications, according to Mark Shainman, an analyst at Meta Group Inc. in Stamford, Conn.

"What they have done with this release is to automate the processes required to [transport the data]," Shainman said.

DB2 Version 7.2, for instance, lets developers treat message queues as if they were tables in the database. This makes it simpler to publish data from DB2 to MQSeries, Davison said.

"This is more of an incremental upgrade than anything else," said Jon Rubin, an analyst at Gartner Inc., also in Stamford.

AT A GLANCE

Interoperable

IBM's DB2 Version 7.2 offers:

- Data management enhancements
- New assist wizards
- Data Warehouse Center enhanced with new sources: SAP R/3, i2 TradeMatrix BPI, Web clickstream data, OLE DB objects and MQSeries messages, including XML documents
- DB2 UDB Text Information Extender, providing a new way to search text documents using a SQL query
- DB2 Warehouse Manager Sourcing Agent for OS/390
- DB2 Migration Tool kit for Sybase T-SQL

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BRIEFS

Ariba, i2 to End Online Marketplace Team

Ariba Inc. will end its collaboration with i2 Technologies Inc. because it doesn't see a viable future for online marketplaces, Ariba executives said last week. Instead, the software vendor plans to focus on procurement; supply chain management; and collaborative planning, forecasting and replenishment – areas in which it competes with Dallas-based i2. Mountain View, Calif.-based Ariba is active in an alliance that creates online marketplaces with i2 and IBM and said it will continue to support existing exchanges.

House Files Bill for IT Training Tax Credit

The backers of a bill filed in the U.S. House of Representatives last week said it would provide a tax break to companies and individuals who incur IT training expenses. The bipartisan bill mirrors a version filed in the Senate two weeks earlier that would provide a $1,500 tax credit per worker, per year for IT training.

Short Takes

BRITISH TELECOMMUNICATIONS PLC in London confirmed that it plans to spin off its wireless businesses as a separate company called BT WIRELESS. Other operations will continue as BT FUTURE. . . . Striving to cut costs, MERRILL LYNCH & CO. in New York said it plans to reduce its workforce by 900 employees, including 150 technology consultants. . . . SIEMENS AG in Munich, Germany, plans to cut an additional 2,000 jobs at its information and communications divisions, bringing the total number of job cuts at the divisions to 8,100, or about 1.9% of its workforce. . . . SABRE HOLDINGS CORP. in Fort Worth, Texas, signed a deal with COMPAQ COMPUTER CORP. with a potential value of $30 million to offer a variety of desktop PCs, notebook computers and services to more than 15,000 Sabre travel agencies.

Class of 2001 Faces Shaky Job Market

Companies rescind tech job offers, cancel annual campus recruiting trips

BY JULEKHA DASH

JOB HUNTING has been like a game of musical chairs for this year's graduating seniors.

Unlike last year, when students waited until they had several choices before picking the right employer, this year's layoffs and sour economy have students jumping at job offers, according to Patricia Rose, director of career services at the University of Pennsylvania. Some firms, particularly in the technology and consulting industries, are even rescinding offers and canceling campus visits.

"The majority of [recruiters] want experienced people," said Arif Hajee, a computer science major who's graduating this week from the University of Texas at Austin. Hajee expected to begin working at Web consulting firm Sapient Corp., but the Cambridge, Mass.-based firm rescinded its offer two months ago and gave him two weeks' salary as compensation.

Top Firms, Grads Affected

Other companies that have taken back offers to students include Dell Computer Corp. and Cisco Systems Inc. Dell wouldn't specify how many offers it had rescinded. A Cisco official said the company withdrew offers to about seven or eight students within the past few weeks.

Even at some of the nation's top technology schools, fewer firms are recruiting students. This spring, 76 companies canceled on-campus visits to Carnegie Mellon University in Pittsburgh, according to Judy Mancuso, associate director at the school's career center. And recently, about a dozen students had offers rescinded.

"We have some of the most talented students in the world," she said, adding that companies need to be aware that rescinding offers can harm their long-term relationships with the school.

Entry-level salaries for seniors with business and technology degrees average about $40,000 to $50,000, according to a salary survey from the National Associatioo of Colleges and Employers (NACE) in Bethlehem, Pa. But that figure represents data culled in the fall, when the economy was stronger, said Camille Luckenbaugh, employment information manager at NACE. The association won't have spring salary figures until the fall.

But even college seniors with good job offers and generous starting salaries are worried, given the state of the economy.

Carnegie Mellon senior and computer science major Jessey Paul received assurances from a human resources representative at Morgan Stanley Dean Witter & Co. in New York that the offer she received in the fall is safe despite a recent layoff at the Wall Street investment banking firm. But after seeing recent graduates receive pink slips from their first jobs, Paul said she doesn't believe there are any guarantees.

"I need to live in New York and pay $1,000 in rent, and the possibility of not having any income is frightening," she said.

Some students unhappy with their job offers have decided to remain in school. Regina Clewlow, a computer science major and president of the engineering club at Cornell University in Ithaca, N.Y., will stay on campus next year to get a master's in management in engineering, which she hopes will help her land a job in business strategy consulting.

"It's not as easy as it has been for students in the past," claimed Luckenbaugh. "Students have to sell themselves more, and employers are more selective."

Goodbye, Grads

Companies withdrawing job offers include:

DELL: Rescinding an unspecified number of offers to MBA interns and college students; offering college seniors one month's compensation

CISCO: Withdrawing 8% to 9% of about 80 offers to students; providing 90 days' pay, plus résumé and outplacement services

SAPIENT: Rescinded an unspecified number of its job offers to prospective college graduates.

HP to Expand Outsourcing Alliance With Consulting Firm

Will focus on legacy migration, integration

BY JULEKHA DASH

Hewlett-Packard Co. and Accenture last week announced that they will expand their IT outsourcing alliance. They will now focus on migrating clients from legacy applications to newer technologies such as Web-based and wireless systems and on supporting backward integration with legacy applications.

In a conference call last week, HP and Accenture said the deal formalizes a three-year collaboration to support enterprise resource planning projects for 15 clients, including Halliburton Co. in Dallas.

Chicago-based Accenture (formerly Andersen Consulting) will design and implement applications, while HP will manage and operate them. The partnership is aimed at enabling the two firms to compete with IBM Global Services, the companies said.

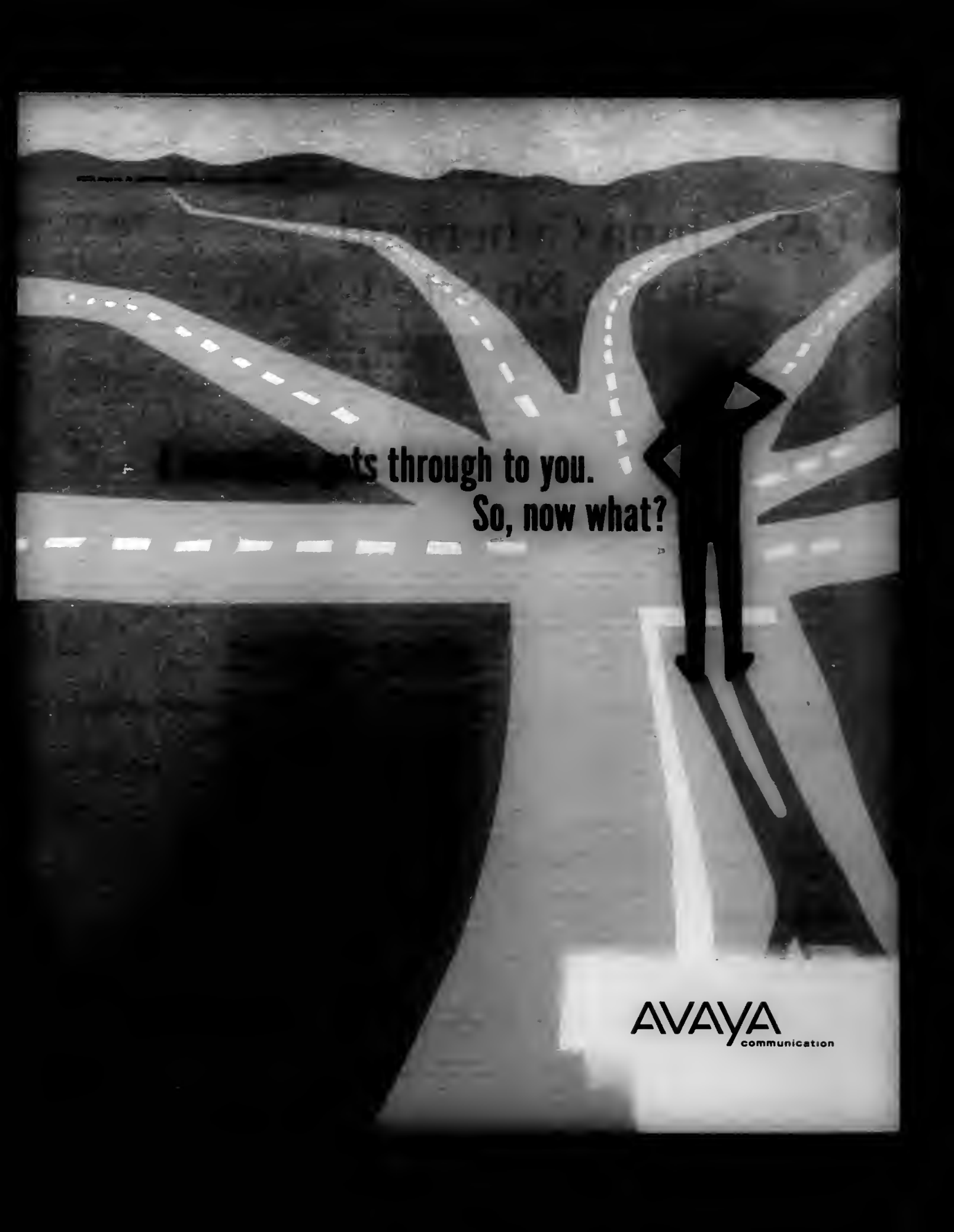
Ann Livermore, president of HP Services, dismissed suggestions that the alliance was a "consolation prize" in the wake of HP's failure to acquire the consulting division of New York-based Pricewaterhouse-Coopers last year.

HP and Accenture said they expect that formalizing their outsourcing alliance will enable them to create an outsourcing blueprint and deliver services more rapidly for clients.

"Soft economic periods tend to make customers interested in outsourcing," she said. HP already derives between 10% and 15% of its services revenue from deals related to its existing partnership with Accenture, she added.

Bill Martorelli, a vice president at Hurwitz Group Inc. in Framingham, Mass., said several consulting firms have tried to expand their outsourcing-related work because the deals are typically long-term and provide an ongoing revenue stream.

Service firms will increasingly partner with other companies that offer complementary services so that they can offer more customization for enterprise customers, said Bruce Caldwell, an analyst at Dataquest Inc. in San Jose.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U.S.-China Cyberfeud Shows No Site Is Safe

Recent hacker attacks demonstrate how any Web site can become random prey

BY JAIKUMAR VIJAYAN

WHAT DO THE city of Kerville, Texas, Primal Elements Inc. in Garden Grove, Calif., and Bubbles Car Wash in Houston have in common?

All three are examples of how automated scanning tools and hacker probes can make random prey of any site, including those that might otherwise seem to be improbable hacker targets, analysts said.

The sites of all three organizations were victims of the ongoing spat between Chinese and U.S. hackers following the recent diplomatic crisis involving the two countries (see related story, page 20).

Sites often get hacked simply because they present an opportunity for vandalism rather than because they represent any ideology or cause that the hacker may espouse, said Ira Winkler, president of Internet Security Advisors Group in Severna Park, Md., and author of *Corporate Espionage* (Prima Publishing, 1999).

Often, all it takes for a company to mitigate its risk is to apply the recommended patches and updates when they become available, since most automated scanning tools are looking for known vulnerabilities, Winkler added.

AT A GLANCE

Defending Your Web Site

Companies should take the following steps to avoid attacks:

- Apply all recommended patches and software updates on *all* Internet-connected systems, not just the big servers.
- Make sure all Internet-connected systems are properly configured.
- Make sure your home page is "read only."

Companies can also minimize their risk by making their Web home page "read only" and getting rid of the cmd.exe DOS prompt on their Web servers, which is ofteo exploited by hackers to generate malicious commands, said Russ Cooper, an analyst at security firm TruSecure Corp. in Reston, Va.

In attacks that rely on hacker tools, "the first thing to remember is that the actual target is often not one that is chosen, but one that is found," Cooper said.

The tools basically search entire ranges of IP addresses for known vulnerabilities that hackers can theo exploit. Eveo large companies with vigorous security measures protecting their main Web servers often overlook smaller Internet-connected servers in their enterprises. Such servers can easily be discovered through scanning and then used to enter corporate sites, Cooper said.

Just last week, the CERT Coordination Center at Carnegie Melloo University in Pittsburgh issued a warning about a "dramatic increase in network reconnaissance activity" involving vulnerabilities in various network services, including one that has been known for more than two years.

Only a week earlier, the National Infrastructure Protection Center in Washington warned about a significant increase in Unix-based network scanning and probing activities. The scans were looking for vulnerabilities to launch denial-of-service attacks.

"To a hacker, you are just an IP address. ... You get hit because you let yourself be an easy mark," said Winkler.

Take Bubbles Car Wash, whose Web site was defaced with anti-American graffiti a week ago. "I was real surprised, because we are not a high-profile site," said CEO William Lawrence.

Primal Energy, a manufacturer of soaps and beauty products, was hit by hackers claiming to be pro-Chinese.

"Obviously, we were all aware of the issue, but we certainly didn't expect to be a target," said Allan Guarino, a vice president at Primal Energy. From now on, the company plans to implement all of the recommended patches when they become available, be said.

Continued from page 1

Solaris

was developed through a collaborative effort that involved ongoing feedback oo the benchmark's drafts from technicians at some of the member companies, such as Shell's Unix gurus.

Donna Francis, who manages compliance security and policy for the IT group at Subaru of America Inc. in Cherry Hill, N.J., said the benchmark's collaborative approach will belp fill security knowledge gaps.

"A [single] company can't always experience all tbe things that go wrong," she said. "It's just impossible."

But tbe true test of the benchmark will be its usefulness over time, said Francis.

"How are they going to keep it updated?" she said. "How are people going to add their experience next year or in the coming mooths as things change?"

Clint Kreitner, the CIS's president and CEO, said the goal is to keep Solaris current through information it gets from members, vendors and others. The CIS will also certify tools.

Other planned benchmarks will deal with Linux and Microsoft Corp.'s Windows 2000 and NT. The organization intends to release the Solaris benchmark next month.

"This is a consensus effort," said Kreitner. "We're not a commercial organization with something to sell. The knowledge is out there; it's just unevenly distributed."

The value to companies will vary. Deborah Eagan, security coordinator at Lincoln Electric System, a Nebraska-based utility with about 110,000 customers, said that as a smaller company, Lincoln Electric will still have to use consultants. But Eagan said she believes the standard will enable the utility to "get much more out of the consulting experience."

Carmen Banks, information security manager at Hallmark Cards Inc. in Kansas City, Mo., said the benchmark will be helpful as a standard to measure subsidiary and business-partnership security.

Benchmark Overview

The Center for Internet Security (www.cisecurity.org) will release its Solaris systems benchmark next month.

WHAT WILL BE AVAILABLE: The CIS will offer public access to the benchmark ruler, which will define security settings for Solaris systems, depending on level of security sought. The full benchmark, which will include supporting information and references, will be available to members. The CIS is considering becoming a subscription-based service rather than a membership-based organization.

WHAT'S UP NEXT: It's next benchmarks include Windows 2000 and NT; Unix variants, including IBM's AIX; and Linux.

Comparative Analysis

The CIS's benchmarking effort is primarily a technical initiative. But companies interested in broader approaches to security can take an approach similar to the one used by Ford Motor Co.

Last July, Ford embarked on a $100 million security upgrade after benchmarking its IT security processes against those of some other, noncompeting companies, including Intel Corp. and Motorola Inc.

"What level of security do they have in place?" said Patrick Milligan, Ford's manager of security, strategy and technologies, who spoke at the Secure E-Business Conference last week in Arlington, Va. Ford shared its internal assessments with the companies involved and compared their security practices with its own processes.

Milligan advised other companies considering taking a similar route to decide upfront whether to utilize consulting services in support of benchmarking or to do it internally.

While big consulting firms offer excellent consulting services, he said, "we at Ford did the benchmarking ourselves to gain a better understanding of security practices/procedures utilized in industry, so that we could effectively develop our internal strategy."

– *Patrick Thibodeau*

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FBI Warns of More Cyberattacks

Site administrators urged to inspect logs for signs

BY TODD R WEISS

WEB SITE administrators are being advised by the FBI's cybercrime division to be especially vigilant in looking for evidence of distributed denial-of-service (DDOS) attacks that have recently hit Web sites.

In an advisory issued last week by the FBI's National Infrastructure Protection Center (NIPC), the agency said it has received information about "ongoing attempts to disrupt Web access to several sites."

The NIPC advisory came after a DDOS attack on the White House Web site on May 4 That attack lasted from about 8 to 11:15 a.m. EDT, causing so many automated requests for information that the servers were overloaded.

An NIPC spokeswoman declined to elaborate on the advisory

Last week's notice followed an NIPC warning last month of an expected upswing in attacks by Chinese hackers against U.S. servers as a result of an increase in political tensions between the two countries.

The latest attacks cited by the NIPC have been seen on several networks, using data fragmented into large User Datagram Protocol (UDP) packets for transmission. The packets are directed at the commonly used Port 80.

The attackers are apparently using this method to try to bypass standard port protocol blocking techniques, according to the NIPC.

To detect such attacks, network administrators should inspect firewall logs and other records for evidence of fragmented UDP packets directed at Port 80. Such inbound packets indicate that a denial of service to the network may be under way. Outbound UDP packets indicate that there's a high likelihood that the network is already compromised by hacker DDOS software.

A special utility to detect DDOS software is available from the NIPC at *www.nipc.gov/warnings/advisories/2000/00-055.htm.*

Ric Steinberger, technology director at San Francisco-based AtomicTangerine Inc., formerly known as SecurityPortal.com, said such attacks have been common for years. Steinberger said he believes the NIPC issued this latest advisory in direct response to the DDOS attack on the White House Web site. "The NIPC needs to issue alerts when one or more federal Web sites have been attacked in this way," he said.

Most private business sites probably have Web servers equipped with firewalls that can help thwart these types of attacks, said Steinberger. Government sites, however, are usually more vulnerable because their staffs aren't as highly paid as their private-sector counterparts and don't have access to the most current software and hardware defenses, he said. ◗

Service Denied

How DDOS attacks work:

- **Hackers overload targeted** computer networks by smothering them with reams of data
- **The overloads cause** the networks to slow and eventually stop responding.
- **At present, there are no sure ways to halt** DDOS attacks.

Postal Service To Upgrade Technology

BY LINOA ROBENCRANCE

The U.S. Postal Service is planning to upgrade its letter-recognition technology, a move that the service says will save more than $92 million per year.

Postal Service spokesman Mark Saunders said the improvements will increase the rate at which current optical readers are able to read handwritten and poorly machine-printed letters from the current 75% to 93%. Just five years ago, the equipment, called Optical Character Readers and Remote Computer Readers, could read only 5% to 10% of those letters, he said.

Saunders said the new technology enhancements are part of a program introduced in 1996 that will save the agency $92.5 million when it's fully implemented in 2004.

According to the Postal Service, mail that can't be sorted by high-speed automation has traditionally been sorted manually, at a cost of more than $55 for every 1,000 letters. Sorting the letters using optical readers costs only $5 per 1,000 letters.

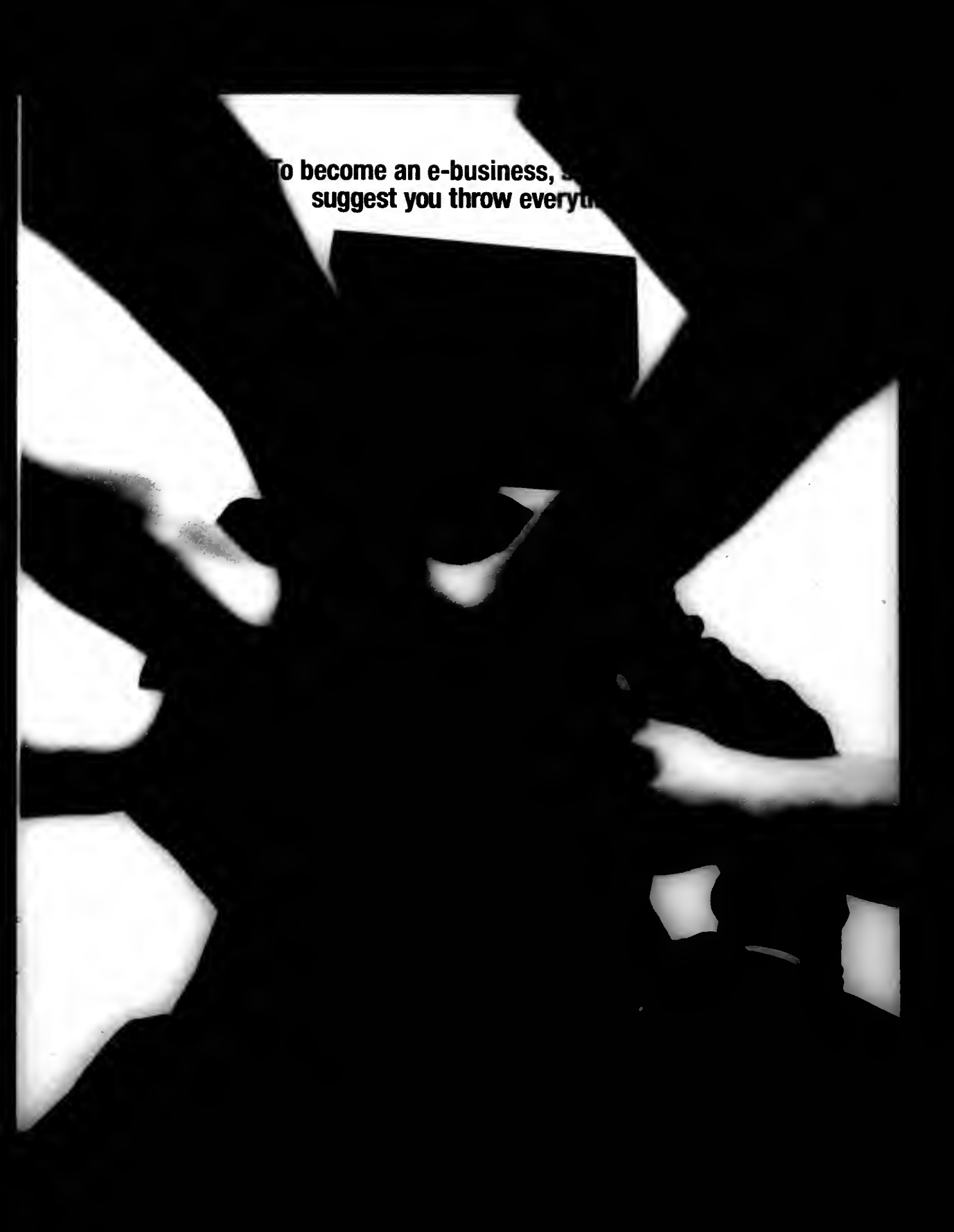
Now, mail that's so illegible that it can't be read by this automated sorting equipment is scanned and the scanned image is sent off-site to remote encoding centers, Saunders said. At these centers, Postal Service contractors read the scanned image of an envelope, manually type in the address information and electronically transmit this data back to the mail processing plant, where a bar code is applied to the mail, which is then re-sent to the automated readers.

The Postal Service has about 35 of these centers, down from an initial 55. The service expects to close more sites as the technology improves. "The primary benefit from increased read rates will be reductions in the need to manually key address information through the remote encoding centers," said Thomas Day, the Postal Service's vice president of engineering, in a statement.

As well as upgrading its optical readers, the Postal Service plans a $16 million upgrade to its Integrated Data System, an information collection and management system. The project will be headed by Lockheed Martin Distribution Technologies in Oswego, N.Y. ◗

THE ASSOCIATED PRESS

A MAIL HANDLER sorts packages at a Postal Service center in Boston. Improvements in optical technology will reduce the number of items that require manual intervention.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Somebody's going to profit
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Competitive Market Forces Storage Vendors to Cut Deals

Enterprise prices drop 24% in first quarter

BY LUCAS MEARIAN

Amid EMC Corp.'s denials that rivals in the data storage market such as IBM and Hitachi Data Systems Corp. are gaining ground, analysts said increased competition created by a slumping economy is forcing vendors to be more aggressive deal makers.

In the first quarter of this year, prices for raw capacity in enterprise-class storage systems dropped 24%, compared with an overall drop of about 35% for all of last year, according to Enterprise Storage Group Inc., a research firm in Milford, Mass.

When IBM released its first-quarter financial report last month, it claimed that its Shark Enterprise Storage System was biting into EMC's Symmetrix customer base. IBM said Shark server sales grew 82% from last year and had penetrated 58% of EMC's top accounts and 63% of the top 100 global companies. The firm said its sales leap was largely the result of its move into Linux-based systems and companies' decisions to "shun" proprietary systems.

The competition "is looking over their shoulder, and we're breathing down their neck," said Bob Mahoney, IBM's vice president of storage networking sales.

EMC, in Hopkinton, Mass., scoffed at what it called "fuzzy" math being used by IBM to produce its sales numbers, claiming that IBM was making no headway in the open-systems marketplace.

"As far as our top accounts, nobody releases their customer lists. Any stats [IBM uses] regarding that are false by default," said EMC spokesman Michael O'Malley. "EMC grew 37% in Q1. That 37% translates to $610 million in increased storage revenue. No one is even close to that."

Others said undercutting the competition has had more of an impact than a move into open platforms.

"Anecdotally, I know IBM is offering very competitive deals

Fuzzy Math?

IBM claims it has penetrated 58% of EMC's top accounts.

EMC says IBM's claim is "false by default" because the company doesn't release its customer list.

on their Shark product," said Gaylen Schreck, an analyst at Cambridge, Mass.-based Forrester Research Inc.

Schreck and other analysts said EMC is also cutting deals to beat the competition.

"They're certainly not being public with us in regard to discounting they might be doing," Schreck said. "When it comes to signing on the line, it's another story."

Steve Duplessie, an analyst at Enterprise Storage Group, noted that Hitachi is also performing well in the storage market. The Santa Clara, Calif.-based company recently saw its fourth-quarter sales leap to almost $500 million, from about $280 million in the previous quarter.

Duplessie said more vendors are "getting a shot [at the enterprise storage market] now, because if you're cheaper, people are going to look at it or use it to drive down EMC's pricing."

Duplessie added that although IBM is making headway in the storage space, it's almost exclusively in IBM mainframe environments, "where you would expect they would. But they're not a force in open systems."

As storage vendors are being affected by a tightening economy, technology is producing more efficient and inexpensive means of storing data.

Roger Cox, chief analyst at Stamford, Conn.-based Gartner Inc.'s Dataquest unit, said the cost of raw disk storage normally drops by 35% to 40% annually because of more efficient technology in the form of cheaper, denser disks.

As the cost of raw storage plummets, the price paid for software to manage it increases. Analysts said that for every $1 spent on tape or disk storage, it costs $4 to $7 more to manage it.

"You'll see the hardware part go down," said H. Clinton Vaughan, an analyst at New York-based Salomon Smith Barney Holdings Inc. "But you'll also see people saying, 'Now I have a ton of disk drives and arrays. How am I going to manage it all?' "

Sun Sharpens Focus on One-Stop Storage

Users cite lower pricing than EMC

BY ASHLEE VANCE

Sun Microsystems Inc. has attacked the storage market with a vengeance, as company officials talk up acquisitions, investments and new products. The vendor claimed its server and storage pairing gives customers one place to shop and "one throat to choke," positioning Sun well against storage king EMC Corp.

The company recently finalized its acquisition of Eagan, Minn.-based storage software maker LSC Inc., and on May 7, Sun launched a set of storage appliances — the StorEdge N8400 and N8600 network-attached storage (NAS) products — designed to give users storage space while requiring minimal configuration effort.

In addition, Sun CEO Scott McNealy said last week that the company would continue making storage acquisitions throughout this year.

Sun may talk a good game, but analysts said the vendor will need to live up to its words to gain market share in a lucrative space.

"Sun tells a good story, but it only holds up in some cases," said Roger Cox, an analyst at Stamford, Conn.-based Gartner Inc.

The StorEdge products are only Sun's second and third NAS products, marking a slow move toward a high-growth market. Beyond its limited NAS line, Sun has also been losing share in the market for storage products linked to its Solaris operating system, falling behind EMC in a sector that it should own, said Cox.

"Sun only got about 32% of that market, when they should be getting 100%," he said.

While Sun acknowledged that it has moved late in parts of the storage market, many customers said they're impressed with the company's prices, which are generally lower than those of EMC for competing products, and with its arguably lower costs for managing those products.

"By getting on a single platform across the board with servers and storage, it meant a single engineer could support both sets of hardware," said Brad Whitley, a network engineer at Devon Energy Corp. in Oklahoma City. "With Sun storage, you are able to manage it with a common interface you are used to when managing their servers."

> I think EMC recognizes the challenge of moving from selling iron to selling bits.
>
> FRANK AUER, VP OF OPERATIONS, GALILEO INTERNATIONAL

While Sun's all-in-one approach may give it an edge, analysts and customers said Hopkinton, Mass.-based EMC is also adding management features as it expands mainframe-style storage with networked technology.

"I think EMC recognizes the challenge of moving from selling iron to selling bits," said Frank Auer, vice president of operations at Galileo International Inc., a longtime EMC customer in Rosemont, Ill.

EMC's software functionality and scalability handily beat Sun's products, Auer said, leading him to conclude that EMC can deflect challenges.

Many analysts agreed, saying EMC will dominate storage for some time to come. The same analysts, however, also said that Sun has obviously sharpened its focus on storage and that the whole-system approach could pay off.

Vance writes for the IDG News Service in San Francisco.

BRIEFS

Cisco Reports $2.7B Loss in Third Quarter

Networking market leader Cisco Systems Inc. last week reported a $2.7 billion net loss for its fiscal third quarter, driven largely by charges taken to cover layoffs, inventory writedowns and other restructuring moves detailed last month. Cisco said revenue in the quarter ended April 28 dropped 4% on a year-to-year basis, falling to $4.73 billion.

CA Builds Wireless Partnerships

Computer Associates International Inc. last week announced a deluge of wireless partnerships aimed at beginning what it calls the second phase of its mobile e-business plans. The announcements, covering everything from partnerships on mobile application development and management to network administration using mobile phones, team the company with Broadbeam Corp., w-Technologies Inc., Novarra Inc., Kyocera Wireless Corp., MobileSys Inc. and Wireless Knowledge Inc.

Short Takes

Disaster recovery vendor COMDISCO INC. announced that it's laying off 250 people, or almost 10% of its workforce, after reporting quarterly losses. . . . COMPUTER ASSOCIATES overstated its annual operating profit by about $140 million last month when the preliminary financial results for its last fiscal year were reported. The company said the mistake was the result of a typographical error. . . . Internet host EXODUS COMMUNICATIONS INC. last week announced layoffs and an executive departure. The Santa Clara, Calif.-based company said it will trim 15% of its 4,500 employees worldwide, in the wake of a quarterly loss. Also, Chief Financial Officer R. Marshall Case is leaving the company for personal reasons; former CFO Dick Stoltz will temporarily resume those responsibilities.

Top PC Makers Preparing for Price War

Lower component costs driving price cuts

BY BOB BREWIN

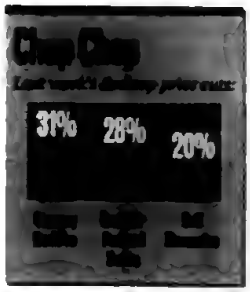
Lower component costs, slower demand and competitive pressures all factored into a round of desktop PC price cuts announced last week by three top PC makers.

Compaq Computer Corp. slashed prices on one line of corporate desktop PCs by 31%. Hewlett-Packard Co. cut prices on its business desktop PCs by as much as 28%, and Dell Computer Corp. dropped prices on its consumer desktop models by 20%.

This round of price cuts is a "skirmish on the outskirts of a potential price war," said Chris Murphy, an analyst at IDC in Framingham, Mass. "Dell has been very aggressive in pricing for the past several months, and some of the other vendors want to keep up, as far as price perception goes," he said.

Murphy added that lower component costs have allowed manufacturers to pass savings on to customers. "Memory prices are particularly depressed, which translates into lower price points [for PCs]," he said.

Steve Telaroli, North American product business manager for the Compaq DeskPro line, said he agrees that reduced prices on memory have pushed



prices lower, as have processor price cuts made by Intel Corp.

"We've had a number of processor price cuts [from Intel], which allow us to continue adding value," Telaroli said.

Compaq slashed prices by 31%, or $577, for its DeskPro EN model with a 1-GHz Pentium III processor, 256MB of RAM and a 20GB hard drive, bringing the price to $1,283. The company dropped the prices of its DeskPro EX with a 1-GHz Pentium III, 128MB of RAM and a 40GB hard drive by about 21.5%, or $286, to $1,102.

Trickle-Down Effect

Achim Kuttler, director of PC client business at HP, said "difficulties in the economy" and lower component costs factored into the company's decision to slash prices by 28%. The company now sells its HP Vectra v1800 model desktop PCs for $1,299, with minitower v1800 models priced at $1,349.

Dell reduced prices on its Pentium 4-powered Dimension PCs with a 1.7-GHz chip by 20% to $1,349 and cut prices on a corporate desktop model with a 1.3-GHz Pentium 4 to $1,199.

Dell spokeswoman Anne Camden said the company intends to keep up the pricing pressure on the competition, within certain limits.

"Dell has said publicly since the beginning of the year that we would offer very aggressive pricing and go after market share," Camden said. "Will we be undersold? I guess a better way to put it is that we will decline to bid when a company asks for pricing that Dell does not believe is in the best interest of its shareholders."

Lawson Web-Enables Flagship Business Software

Company's strategy still focuses on some vertical markets

BY MARC L. SONDINI
ANAHEIM, CALIF.

Lawson Software last week detailed plans to make its suite of business applications more Web-enabled and automated, a strategy that was met with approval by some of the attendees at the company's annual user conference here.

St. Paul, Minn.-based Lawson said a new version of its flagship software, dubbed Lawson.insight 8.0.2, is due for general release in August with expanded modules aimed at users in the health care market and other vertical industries.

For example, applications supporting workforce performance analysis, online procurement and Web-based recruiting and hiring are being upgraded with capabilities specific to health care users.

The company plans to eventually roll out new portal, online data analysis and wireless applications to support the Lawson.insight suite, according to company executives. That part of the development plan includes the future addition of support for the Wireless Application Protocol and for running data analysis queries from wireless devices.

Jay Coughlan, who was named Lawson's CEO two months ago, said at the conference that the company will continue its strategy of selling only to certain vertical industries — primarily, health care, retail and the services and government sectors.

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Coughlan added that Lawson plans to continue avoiding manufacturing industries, where giants like SAP AG dominate.

User Anticipation

"I'd like to see [the promised upgrade] rolled out," said Peter O'Neill, project director for management information systems at Yale New Haven Health System, a network of three hospitals based in New Haven, Conn. He said he has a strong interest in Lawson's increased focus on Web-based processing.

The three hospitals recently installed Lawson's earlier Insight 7.0 applications for procurement and finance, and they're now adding human resources and payroll applications.

O'Neill said he would have preferred to go with Lawson's 8.0 series because of its online capabilities, but that version wasn't available when the implementation began.

Cutting labor costs by automating business processes is especially appealing to users in the cost-conscious health care field, said Bill Myers, director of materials management at Mission St. Joseph's Health System in Asheville, N.C. Mission St. Joseph's runs Lawson's human resources, payroll and materials management applications.

Now, Myers said, the company is testing a customized employee self-service tool from Lawson that would automate inventory-receiving functions. The goal is to reduce the number of packages lost or erroneously processed, an outcome that Myers said could save Mission St. Joseph's thousands of dollars by reducing the manpower needed to search for missing inventory.

"It was almost impossible to track [inventory] using manual systems, with the volume of orders," Myers said. "Using paper takes a long time."

The self-service application is expected to be ready for use by the end of this month, he added.

PATRICIA KEEFE

P2P for IT Execs

IT IS MISSION-CRITICAL to leading corporations, but you'd never know it from the size of the CIO pay packet. According to an exclusive *Computerworld* survey detailed in this week's Cover Story, fewer than 5% of Fortune 1,000 CIOs are named on the proxy statement. Only 46 of these companies compensate their IT leaders on a par with other senior business executives. And while corporate vision and business strategy often rest upon the success of IT as a competitive weapon, many CIOs still hit a wall when they try to claim a seat in the executive suite.

PATRICIA KEEFE is *Computerworld*'s editorial director. Contact her at patricia_keefe@computerworld.com.

What's the real problem here? It could be the lack of mission-critical connections, frankly. As a relatively new executive position, CIOs just don't have the well-established peer networks that serve their business counterparts so well. We'd like to help change that. This week, we're introducing *Computerworld* Executive Suite, a private online community where IT leaders can meet and talk about technology issues and business problems.

Think of it as a one-stop professional connection built for busy IT execs. We've stocked this new community with exclusive content, online services, research and other professional resources. We invite you to apply for membership at *http://exec.computerworld.com* and join in this online discourse with your peers.

In the arena of off-line peer networking, we're also trying to do our part. Next week at our Premier 100 IT Leaders conference in Rancho Mirage, Calif., we will honor the best practitioners in the field. We'll provide a forum for users to debate pressing industry issues and share advice and war stories.

Finally, this week's issue comes repackaged in a slightly smaller format and features a new tool to better help you find stories and online information of interest. The more portable format is the first step in our ongoing plans to converge our print and online content to better serve your needs. As you leaf through this issue, you'll also notice some bar codes tucked here and there. We're deploying these CueCat bar codes to direct readers to value-added content online.

We hope these new offerings will help you reach your own mission-critical goals. Let us know how else we can help.

PIMM FOX

Telco Legislation Not Favorable to IT Managers

THE MOST RECKLESS attempt by lawmakers to meddle in IT issues is the current effort by House Energy and Commerce Committee Chairman W.J. "Billy" Tauzin (R-La.) and John Dingell (D-Mich.) to gut the 1996 Telecommunications Reform Act.

Congress passed that law to spur new telecommunications services and competition with the Bahy Bells. It barred the Baby Bells from offering long-distance voice and data service until they proved that local markets were open to competitors. In addition, the law mandated that Baby Bells offer competing companies discounted access to phone lines and equipment for new services. After all, the Baby Bells inherited the copper lines and switching stations as a result of the AT&T hreakup in 1984.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

After the 1996 law took effect, new companies, armed with an estimated $60 billion in investor money, were poised to offer alternatives for voice, data and Internet service. But reality has turned out differently.

Upstart providers Viatel and Winstar have filed for Chapter 11 bankruptcy protection. NorthPoint Communications has gone bust, Rhythms NetConnections' viability is in question, and Covad Communications has laid off 800 people and scaled back operations. The cost of gaining access to telco facilities and lines has wrecked their business models.

And contrary to the spirit — and letter — of the 1996 legislation, there's little competition for local business or consumer service. The reasons are as complex as the legislation, but the remaining Bell companies — Verizon, SBC Communications, BellSouth and Qwest — have 90% of the local service markets. And through their regional monopolies, they also have some 70% of the high-speed market.

The Baby Bells were supposed to grant competitors access to their lines for the last mile of

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connectivity. They also had to share networks for voice and DSL services. But most of the Bells delayed broadband offerings, preferring instead to play bardball witb competitors.

DSL providers rent copper lines from the Bells to offer service. In some cases, phone companies charge a DSL competitor $20 a month for the same line for which they charge residential customers $12. In addition, DSL providers rent space at phone company facilities — typically a rack in a cage — at rates as bigh as $50,000 a month to house their equipment. The local pbone companies tbwarted newcomers with tactics guaranteed to produce losses for competitors.

The Tauzin-Dingell bill strips away injunctions that bar the Baby Bells from the long-distance data market while letting tbem prevent competitors from leasing or reselling services necessary for broadband deployment.

If the bill (HR 1542) passes, IT operations will face higher bills as ISPs go the way of DSL providers. Use what little bandwidth you have left to share your opinion; send e-mail to Dingel at public.dingel@mail.house.gov, or contact Tauzin via his Web site, at *www.house.gov/tauzin/address.htm.*

DAVID FOOTE

Latest Trends From IT's Rank and File

IF YOU REALLY WANT to know what's up with the IT workforce at the moment, go ask 24,000 IT workers. That's what Foote Partners did from January through April, interviewing and surveying executives and employees from more than 1,500 companies.

David Foote is managing partner and research director at Foote Partners LLC, an IT workforce management research firm and organizational development consultancy in New Canaan, Conn. Contact him at dfoote@footepartners.com.

What's up is that senior management is demanding a return on its sizable IT human capital investment.

Here are a few key preliminary findings (more will come in future columns):

Shock and disbelief persist. How could things have fallen so far, so fast? IT workers, whether they've lost a job, seen a project canceled, hold worthless stock options or are entertaining premature thoughts about early retirement, remain stunned by the depth and swiftness of recent changes in the economy. They're still coming to grips with the impact on their jobs and careers, but especially on dashed dreams of New Economy milk and honey. The shock is even more pronounced in tecb meccas like Silicon Valley, where more fortunes were built.

Clearly, those who have never worked through a recession (Oops! I mean "economic downturn") are tbe most anxious. But many veteran managers, who boasted in our interviews about contingency plans they had drawn up well in advance to cope with economic turbulence in projects and staffing, admitted having difficulty executing their plans. While history may repeat itself, it's just not the same in this labor market with this intense a mixture of complexity and competitive pressures and, arguably, so much more at stake.

Salary increases are flat (but pay is up). Huh? Base salaries for about 90 IT positions we track were flat in the first quarter over the previous one. But variable pay (bonuses, incentives, skill premiums) rose an average of more than 3% of base salary, a huge rise for one quarter. The trend: IT workers are being held more accountable for their impact instead of simply showing up for work.

Expect to see more team- and project-based incentive pay as budgets undergo case-by-case scrutiny to focus resources on projects that bring short-term tangible benefits or immediate returns involving customer satisfaction.

Red-hot market for skills. The market for various in-demand IT skills and certifications is electric. Technical and project skills are increasingly being isolated and rewarded by employers to keep total compensation competitive in the face of stagnant base salaries and hard-nosed CFOs desperate to cut costs. While the laws of supply and demand routinely influence the relative values for skills bonus premiums, shrewd employers now make quarterly instead of annual adjustments to capitalize on constant market fluctuations. And employers are being far more selective about doling out skills pay, especially for workers bolding certifications; they're more inclined to save the big bucks for those who also have project or functional area experience and will be working on projects sure to deliver an acceptable return on investment.

Strategic job-hopping. Talent may be flowing into the market from busted dot-coms, but the smartest IT workers are leaving perfectly comfortable jobs for well-managed employers they surmise will survive the economic doldrums relatively unscathed. In return, employers are asking job candidates for greater commitment but also offering higher at-risk pay packages tied to performance, sometimes even measured over multiple years of service, similar to executive pay programs.

The ante's been upped for IT workers who choose to stick around. For managers and workers alike, it's time to get tough and look sharp.

READERS' LETTERS

Aiding Spammers

REQUIRING recipients to opt out of e-mail from spammers merely provides the spammer with confirmation of a valid e-mail address, which can then be compiled into spam mailing lists and sold to other spammers ["Senators Show No Taste for Spam," *Computerworld.com*, April 30]. It's a catch-22: The more spam you decline, the more mailing lists you get placed on and the more spam you receive.

Marc J. Karun
Norwalk, Conn.

Medical Shutout

THE FEDERAL government's new federal medical-records privacy regulation is really antiprivacy ["HIPAA Rules Go Into Effect Without Changes," Page One, April 16]. It gives enormous enforcement powers to the secretary of the Department of Health and Human Services. According to Sec. 164.506 (a)(1) of the regulation, if you don't consent to your personal medical records being disclosed, your physician may refuse to give you medical care, or you may be denied coverage by a health-insurance plan.

Bill Holmes
Carlsbad, Calif.

Train Now, Not Later

WHY ARE our tax dollars being spent training inmates ["Tech Training for Inmates a Risky Undertaking," News, April 9]? I'd rather spend the same money on programs for inner-city youths. Otherwise, think what happens: Kids with few or no options turn to crime, go to jail, then get the training they missed out on as kids.

Ed Sanborn
Andover, Mass.

Disabled and Willing

GARY ANTHES' column "Keep the Disabled in Mind When Building Systems" [News Opinion, April 30] was quite fortuitous in timing, since a visually impaired person is applying to the law school, and we're considering how to meet the needs of visually impaired computer users. But I was disappointed that you included no references to useful resources.

Keith J. Barton
IT director
Case Western Reserve University School of Law
Cleveland

Editor's note: *You'll find an abundance of resources by clicking the link that accompanies this letter on our Web site, at* www.computerworld.com/letters.

ONE-TENTH of males are at least partially color-blind, and software often uses subtle variations in color to communicate information. Simply adjusting the colors to more obvious, brighter ones would make a world of difference to us.

Bruce Gomes
Database administrator
Monroe, N.Y.

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

DAN DRAKE

Users Must Revive PC Innovation

SINCE THE U.S. COURT of Appeals probably won't address the critical issue in the Microsoft antitrust case — reviving software innovation — we software customers must do so. Unless we do, we won't get the innovations that can improve our productivity.

There certainly has been innovation on the Internet and other platforms but not in the PC market. In 1998, *Computerworld*'s then-editor in chief, Paul Gillin, lamented: "The PC market has been stagnant as a platform for innovation for at least three years" [News Opinion, March 16, 1998]. He pointed out that innovation had shifted to other platforms: the Internet, wireless devices and ubiquitous computing.

Dan Drake believes that software customers have unwittingly paralyzed software innovation and that they, not the courts, are best able to revitalize it. Contact him at [redacted]

By using ideas from Netscape's Navigator to create Internet Explorer, Microsoft sent a clear message to third-party software developers: Any innovation on the PC platform (having a large enough potential market) could become the basis for future Microsoft products. Unable to prosper in that market, vendors innovated elsewhere.

The explosive growth of innovation on other platforms was partially created by those who avoided the PC market. These platforms will play important roles in the future of IT innovation. But unless we learn from what happened to innovation on the PC, we won't prevent it from happening to other platforms, nor will we revive it on the PC.

The PC remains the best platform for many productivity-enabling applications and for the client side of many Internet and client/server applications. But until we make it safe to go back into the waters of PC software innovation, we will see only limited innovation there.

While Microsoft's actions ultimately led to the demise of PC software innovation, we software customers must accept responsibility for embracing its strategies. Our acceptance eventually paralyzed PC software innovation. That paralysis became so acute that PC sales declined enough that even Microsoft issued profit warnings.

I have already suggested that software customers are partly to blame for the drought in PC innovation [News Opinion, June 5, 2000]. The best thing we can do to encourage productivity-enabling innovations is to reward the original innovators and their investors. This may mean, for example, that we should reconsider adopting Microsoft's .Net platform. It may be a comprehensive development environment with stronger storage management and object-oriented capabilities and exception-handling facilities.

But it wasn't until after Sun rolled out Java with those same enhancements that Microsoft created .Net and C#, which combined are a potential Java competitor. To reward the original innovator, we would have to adopt Java instead of .Net.

It would take courage to do that. In some ways, .Net is "Java done right." Unlike Java, .Net provides those same capabilities for its flagship C# language and many others. Microsoft worked with other developers so their languages would support these capabilities on .Net, too. We might encourage Sun to help developers of other programming languages generate code for Java virtual machines.

This would require asking developers to do the same thing for Java that they already did for .Net. But if we don't do that, we'll tell potential innovators that in the end, we software customers will buy Microsoft's version of their ideas but not their own. If we do that, innovators won't risk developing the productivity-enabling software we really want and need.

THORNTON MAY

IT, HR Can Be Better Partners

IT WASN'T SO LONG AGO that the ears of newly made, tech-aware senior executives were ringing with Chicken-Little-like laments predicting an apocalyptic IT skills shortage. Alarmists counseled executives to pay any price, bear any burden, hire any chef and fund every amenity to help make high-performance IT employees happy. The Silicon Valley press was filled with stories of companies creating spa-like environments to attract IT professionals with the right stuff.

Thornton May is corporate futurist and chief awareness officer at Guardent Inc. in Waltham, Mass. Contact him at [redacted]

Two cottage industries emerged: the "trackers" (recruiting firms that, for a handsome bounty, would ruthlessly target and solicit sought-after skills) and the "smackers" (firms that would design high-visibility lifestyle programs designed to kiss the butts of gold-collar employees). The primary focus of human resources departments appeared to have been in serving as the entry point for employees.

But it appears that the days of Caligulan excess are over. Indeed, not only is the party over, but people are also being forcefully removed from the dance floor (that is, getting laid off). Many HR professionals, previously charged with finding high-skill employees, are now trying to get rid of them and having to be the bad guys where they once were good guys.

I freely admit that some of my best friends are HR directors. They are much more than their perception as being gatekeepers to new employees, rump kissers to the still-employed and bouncers to those on the way out. They serve the much-needed role of therapist, guide, cheerleader, truth definer and role model/disciplinarian in our increasingly high-stress workplaces.

I predict that the most valuable conversations taking place in organizations during the next five years will be those between IT, HR and marketing. This is a radical departure from mainstream thinking. During the dark days of downsizing and IT pogroms that accompanied the economic downturn of the late 1970s and early '80s, the one point of happiness for CIOs was that everyone in the organization hated HR more than they hated IT. IT professionals have indicated to me that while they wish for a better relationship with HR, they view it as part of the problem.

In most organizations, the history of the interactions between HR and IT more closely resembles that of the Hatfields and the McCoys rather than the collaboration of *Star Trek*'s Mr. Spock and Dr. McCoy. IT leaders have a vested interest in working with HR. You can't "give good IT" without good IT people, and you won't have affordable, good IT people if you don't have a great working relationship with HR. It's more than a source of skills.

The sensitive management of customer information can only be accomplished by a full-body partnership between IT, HR and marketing. This is the heart and soul of the new enterprise. Industrial and individual customers have become increasingly sensitive to how their information is managed. Our tamper-resistant information systems can only be as secure — and the customer information entrusted to us can only be as private — as our employees choose to make them.

Observers of top-of-the-house executive behaviors will tell you that HR professionals are rebelling against their historical ghettoization as gatekeepers or bouncers, depending on economic circumstance, and are rejecting the role of being litigation insulators and having to say, "Make sure we don't get sued when we fire people."

HR is lobbying to play a key design role in creating the culture of the increasingly unbounded organization. IT should support those efforts.

BUSINESS

DIVERSITY GAP

IT has been slow to successfully incorporate minorities into its upper ranks, writes Theresa House. The problem, she argues, is that firms don't take their own hiring policies seriously enough. ▸ 32

WEB CAR FIRMS JOIN FORCES

Model E, which tried unsuccessfully to sell luxury build-to-order sport utility vehicles on the Web, merged earlier this month with another Web-based auto sales firm, in hopes that joining forces will be the key to success. ▸ 31

DOUBLE DUTY

With so many intersections between business and IT, more colleges are offering dual degrees that combine technical skills with business know-how. ▸ 41

PAYING THE PIPER

An exclusive *Computerworld* study of mandatory SEC documents from last year shows that only 46 of the Fortune 1,000 companies paid their CIOs on par with other senior corporate officers. What does that say about how companies view the importance of IT? ▸ 42

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PHOTOS BY CHERYL KIRP
ILLUSTRATION BY FRANCISCO CACERES

WHICH WIRELESS APPS WILL WIN?

IN A ROUNDTABLE DISCUSSION CO-SPONSORED BY COMPUTERWORLD, A PANEL OF EXPERTS weighs in on which wireless applications will succeed in business-to-business and business-to-consumer e-commerce. The group also discusses the key challenges organizations face in rolling out those applications and how companies can measure the return on their wireless investments.

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MONDAY'S WEBCASTS

Ralph Szygenda, CIO, General Motors

8:15 a.m. PDT / 11:15 a.m. EDT — **Keynote: Ralph Szygenda, CIO at General Motors**
"Going Digital the Old-Fashioned Way: GM's Level-Headed Approach to E-Business

2:15 p.m. PDT / 5:15 p.m. EDT — **Panel Discussion: Wireless Warriors and the Challenge of M-Commerce**
Few technologies hold as much promise - or pose as many perils - as wireless networks and mobile computing. What are the best practice in deploying mobile commerce applications to resolve security concerns and location-service controversies? Which applications make sense for wireless LANs? How do you choose an architecture for your user base? How solid is the Wireless Application Protocol standard? Panelists will examine some core questions through the lens of their experience, adding practical recommendations for the next wave of wireless warriors.

TUESDAY'S WEBCASTS

Doug Busch, CIO, Intel

8:15 a.m. PDT / 11:15 a.m. EDT — **Keynote: Doug Busch, CIO at Intel Corp.**
IT Leadership in a Changing Economy

9:00 a.m. PDT / 12:00 p.m. EDT — **Panel Discussion: Heavy Hand of Uncle Sam in Online Security and Privacy Protection**
The U.S. government has new regulations or proposed legislation wherever technology touches its citizens. Concerns about data privacy further politicize these areas where IT can clearly be held responsible. The high-tech sector remains split about how to approach online privacy guarantees in the U.S., while the European Union has already adopted tough data protection laws. What will these diverging sets of international privacy laws mean for your company? On the flip-side of privacy is security. What role should government play in helping companies protect their systems? What are your concerns about government involvement? We'll discuss strategies for keeping ahead of Uncle Sam in this regulatory environment.

2:15 p.m. PDT / 5:15 p.m. EDT — **Panel Discussion: The New ROI: Tracking Technology Payback in a Tough Economy**
The build-out of e-business is ongoing, but the pace has slowed with the downturn of dot-com fortunes. But the intersection of IT and business is still a very busy place. Now is the time to recession-proof your IT organization, generate new ideas and find new revenue streams. How is your company using the Internet to streamline processes within the organization and deal more effectively with your supply chain? Are you creating online relationships with partners and competitors? Where can you use IT to create new products and services? Focusing on the real business opportunities and ROI behind technology expenditures is this panel's mission.

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Online Automakers Look for Boost From Merger

BTO to sell Web-based build-to-order cars

BY LEE COPELAND OLAOWIN

MODEL E CORP a dot-com that tried unsuccessfully to sell build-to-order cars via the Internet, took a second shot at success this montb and merged with a Santa Monica, Calif.-based start-up that devised outsourced vehicle productioo plans.

Model E and Flint Inc. will merge into a single company with the temporary name of Build-To-Order Inc. (BTO). By 2004, Fremont, Calif.-based BTO plans to offer a line of custom-built vehicles that will cost about $35,000, although officials said they hope to outsource production to other automakers with excess manufacturing capacity.

"The odds of this company's success are slim, but there are some things that it has to work with," said Jonathan Gaw, an analyst at IDC in Framingham, Mass. For example, Gaw said, BTO has the advantage of not having a dealer network, which typically adds 15% to 20% to the price of a car.

But Gaw cited other barriers that BTO will have to surmount, such as the high cost of establishing a brand.

When Model E launched its build-to-order Ironman luxury sports utility vehicle in November, it drew praise from analysts for ushering in a Web-based approach to developing custom-built cars before the established automakers did. But there was skepticism about the prospects for a vehicle with a starting price of $100,000. And BTO officials acknowledged this week that Model E never produced any of the cars.

Scott Painter, founder of Flint and chairman of BTO, said the merged company won't face the high costs of building a national brand. Instead, BTO plans to use the Web as its primary advertising vehicle and focus on a smaller audience of tech-savvy individuals. Production of the cars will be outsourced to other automakers, thereby eliminating the need for manufacturing facilities, he added.

"We're not looking to build a national brand on par with Volkswagen," said Painter. "Our break-even point is so low that's its not a difficult burdle to cross."

Many of the details surrounding the planned merger of Model E and Flint still need to be finalized. In addition to settling on a permanent name, the companies still need to secure additional financing, recruit new executives and name a board of directors. William Santana Li, founder and former CEO of Model E Corp., was tapped to be the CEO of the merged company.

New Dealer in Town

Build-To-Order, the company formed by the merger of online start-ups Model E and Flint Inc., plans to offer vehicles developed using computer-aided design technology. Those vehicles will:

- **Be custom-ordered online**
- **Cost about $35,000**
- **Be available by 2004**

ASP Reveals Visitor Habits

BY MARK HALL

Keeping an accurate tally of Web site traffic remains elusive, but marketing-driven companies are adopting tools to improve their precision in counting who's visiting, where they go and, most important, what they buy.

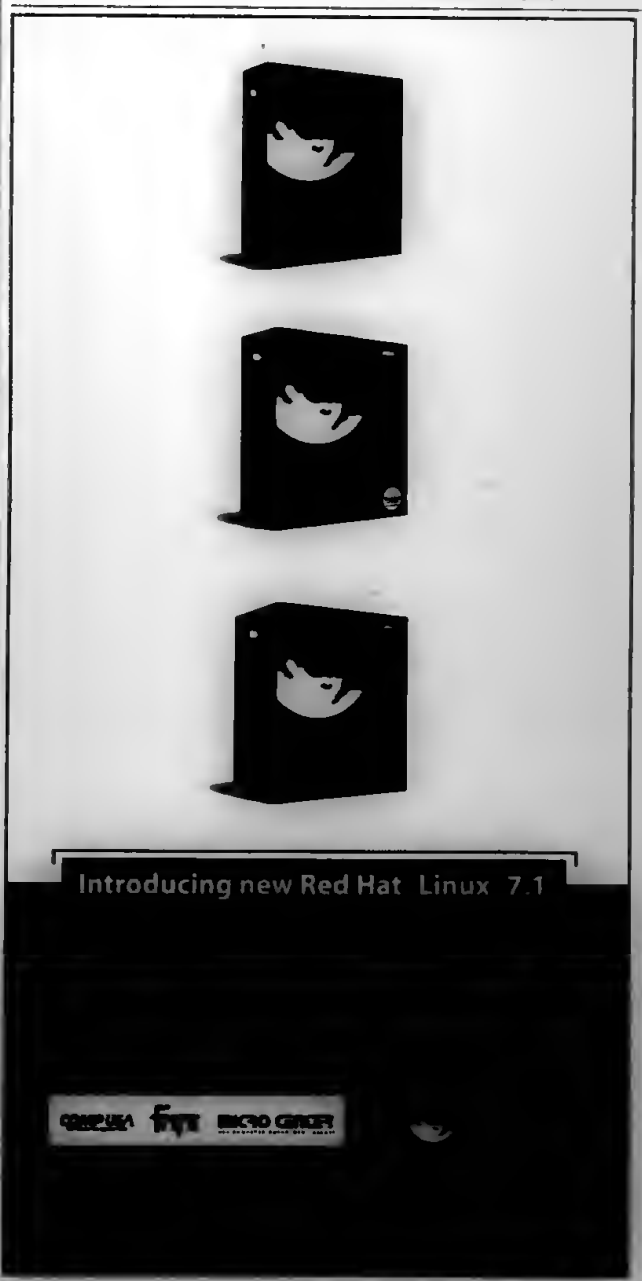
Last week, Hanover Direct Inc. rolled out two more online businesses that use eLuminate, a Web-traffic analytic service from application service provider Coremetrics Inc. in San Francisco. The $600 million catalog and online retailer now operates nine Web sites with the eLuminate service, which gathers aggregate statistics "on everything from clicks to lifetime value of the customer," according to Hanover Direct's Internet marketing manager, Jonathan Kapplow.

An overriding issue for Weehawken, N.J.-based Hanover Direct is privacy, said Guy Creese, an analyst at Aberdeen Group Inc. in Boston.

One reason why Hanover Direct chose Coremetrics is because it strips away individually identifiable information before Kapplow's staff analyzes the numbers for marketing research.

Minesh Shah, a marketing manager at Brisbane, Calif.-based Walmart.com Inc., said he chose it for similar reasons. Walmart.com is owned by Bentonville, Ark.-based Wal-Mart Stores Inc., Palo Alto, Calif.-based Accel Partners, and other investors.

"We evaluate this information in aggregate, rather than look at individuals' shopping habits," he said. "Further, our Coremetrics implementation is anonymous, so none of our customers' personally identifiable information is shared."



THERESA HOUSE/DIVERSITY

Equal IT Hiring a Must

INFORMATION TECHNOLOGY has traditionally been slow to successfully incorporate minorities into its upper ranks. Has IT really looked into their potential? To address this, a company must look at what it expects from its IT resources.

Typically, IT people are recruited because of their technical abilities. And IT employees who are minorities remain in the same positions for many years after their nonminority peers have been promoted and continue to be promoted. Though there are exceptions, the overall percentages of minorities in IT and the upper IT ranks haven't increased over the years. Other industries are just more serious when it comes to workplace diversity.

To understand why IT isn't successfully incorporating minorities into its executive ranks, we need to fully understand who's making the hiring decisions and who cooducts the interviews.

A November survey of job-seeking minority IT professionals that was conducted by a national African-American organization found that people cooducting interviews really have little in commoo with mioority job seekers and are more likely to hire people with whom feel they have the most in common.

Take this hypothetical example: Human resources seods a group of résumès to Lance, a hiring manager. Some of the names are culturally differeot from Lance's. Even though their credeotials are outstanding, if Lance isn't forced to interview these people, chances are good that human resources woo't receive a request from Lance to prescreen them.

Theresa House has spent more than 20 years in IT work, from technical positions to management. You can contact her at theresa_house@yahoo.com.

Let's say, for instance, the names don't give away the applicants' cultural identities, and Lance asks to speak with or meet Jasmine, who has the most impressive résumé, and Richie, who barely meets the job qualifications. What happens when ooe of the candidates turns out to be someooe of a different cultural or ethnic group?

Jasmine goes in for an interview with Lance. She's dressed in khakis and a polo shirt; her hair is in cornrows. Lance finds Jasmine's credentials and experience impeccable. Jasmine smiles frequently during the interview and asks about the environmeot

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and development workflow processes. She's articulate, and her questions and answers relate to what she can bring to the job.

But Lance doesn't see Jasmine as being a good fit for the team on which she would work; they don't make a connection. Lance doesn't relate to Jasmine and feels uncomfortable speaking with her.

An hour later, Richie, whose outward appearance is very similar to Lance's, comes to the interview wearing khakis and a polo shirt. He immediately asks about development tools, then he and Lance strike up a conversation about last night's hockey game. Richie is referred to Lance's boss for a second interview; Jasmine isn't called back. Who gets the job offer, and why?

Lance isn't aware that he's not conforming to his company's policy of hiring the best-qualified person who has the most experience and who can bring the most to the team. In *his* mind, he's choosing the most qualified candidate. He may recommend Jasmine to another group because of her credentials. But what's wrong with this picture?

Though many companies blow their own horns about their diversity programs and don't base their hiring practices on color, religion or sexual orientation, these policies are *not* being implemented at the hiring level and definitely are not supported through internal advancement.

> How do we better hire, retain and promote minorities?

Worse still is the fact that corporate expectations aren't being met where diversity is concerned. Human resources will find qualified candidates and refer them to the hiring managers. But the people doing the hiring will typically hire the people they believe will "fit in" best in IT.

How do we better hire, retain and promote minorities?

Good managers, regardless of their personal views, should hire and promote the most qualified people. But more important, companies should begin to look closely at the number of minorities who are interviewed and not hired and then find ways to educate their managers on cultural sensitivity and compliance with company policy.

Hiring managers should look beyond what's apparent in a candidate and really find out what makes him tick. After all, if he passes the prescreening and makes it into the manager's office for an interview, there has to be some serious interest in the candidate.

Also, managers must develop their subordinates' personal skills in relating to minorities, if they want to keep and promote everyone.

Good managers manage people according to their companies' expectations, not their own. Until everyone's expectations are met and managed, IT will continue to operate on its present course and minorities will continue to be left behind.

MORE ONLINE

For an online discussion of diversity in IT, visit www.computerworld.com/diversityforum.

WORKSTYLES

Keeping Track of Customer Data A Challenge After Merger at Peco

What it's Like To Work at...

Interviewee: Kathy Walters, vice president of IT
Company: Peco Energy Co., a division of Chicago-based energy giant Exelon Corp., a company created from the October merger of Peco and Unicom Corp., the owner of Commonwealth Edison Co. (ComEd).
Main location: Philadelphia
No. of IT employees: 65, plus about 90 contractors
No. of employees (end users): 2,700
What impact has the merger had on IT? "The corporate IT function relocated to Chicago, and Peco buys the group's services, such as help desk services. Peco manages its own applications development and maintenance, architecture and strategy, operations and support for day-to-day tactical issues, process improvements and cost management of all IT-related expenses.

"The big difference is we're working very closely with our counterparts [across Exelon] to get common systems and processes. For example, we're working with the customer service group to assess what to do with our call centers in the East and West and how to implement common solutions for bill printing and dispatching and processing for accounts receivable. Also, Peco is installing a new outage-management system in July, and then ComEd will evaluate it and try to leverage that solution in Chicago."
Other major initiatives: "A new browser-based front end for our customer information system, to make the call center more efficient; a customer data warehouse comprising different data marts that will help streamline our reporting processes; and, in concert with the rest of Exelon, we're migrating the data center from Lexington, Ky., to Joliet, Ill."
IT training: "Some soft skills training, technology training related to Web development, Oracle database administration, process development and applications life-cycle development."
Employee reviews: "Our goal is to do them at least twice a year, but our target is four times, at the end of each quarter. [We have an] informal sit-down at the end of the first and third quarters and formal reviews at midyear and year's end."
IT career paths: "We have a pretty flat management hierarchy. Our people are required to have a four-year degree in IT, and they come in after college as a business analyst, progress to senior analyst, to team leader or consulting analyst and then to project manager. From there, it would be director and then vice president."
Workday: "When we get into the thick of it, 6 a.m. to as late as the next morning. But, usually 7, 7:30 a.m. to 6, 6:30 p.m."
Must people carry beepers? Cell phones? "At least half carry beepers, and the management team carries cell phones."
Is a security badge or card needed to get into building or office? Yes
Workspace: "We're in the midst of moving to a higher floor – our goal is for all of IT to be together, and we talked about whether we wanted to have a lounge area with comfortable chairs and toys, but employees said they didn't need that. Instead, we revamped the kitchen area so it's more conducive to conversation."
On-site amenities: A fitness center
Last companywide/department perk: Free tickets to the Penn Relays, an annual track and field event at the University of Pennsylvania

– Leslie Jaye Goff (ljgoff@ix.netcom.com)

PETER G.W. KEEN

Key Shift for IT

THERE'S AN IMMENSE SHIFT UNDER WAY in the responsibilities of effective IT organizations. Historically, their sphere of concern was managing technology: expenditures, development, operations and support. Now, about five years into the e-commerce era, the main issues IT must increasingly address are the impacts of technology.

The Internet, PCs, e-commerce and mobile commerce have accelerated the shift of technology from the periphery to the center of more areas of business, society and everyday life. Here are just four areas that will need new IT expertise, experience and education: energy and conservation, privacy, taxation, and consumer protection. This list may seem surprising, but in a way, it reflects how successful IT, e-commerce and the computer and telecommunications industries have been in helping turn the academic network infrastructure of the old Internet into a force that's at the center of the most far-reaching, progressive changes in our world today and into tomorrow.

IT's impacts go well beyond the management of technology now; my list adds up to an essential extension of its skill and responsibility base.

The following are reasons why:

Energy and conservation. About 12% of all electrical energy consumption in the U.S. is for IT operations. In some ways, the corollary to Moore's Law (that hardware price-performance doubles every 18 months) is that demands for air conditioning, which helps cool data centers, and managing that energy, increases faster than energy supply, if not proportionately. Add the growing problems of disposal of batteries, obsolete equipment and print cartridges, and it's clear that IT will increasingly need to take energy and conservation into account in its planning and operations.

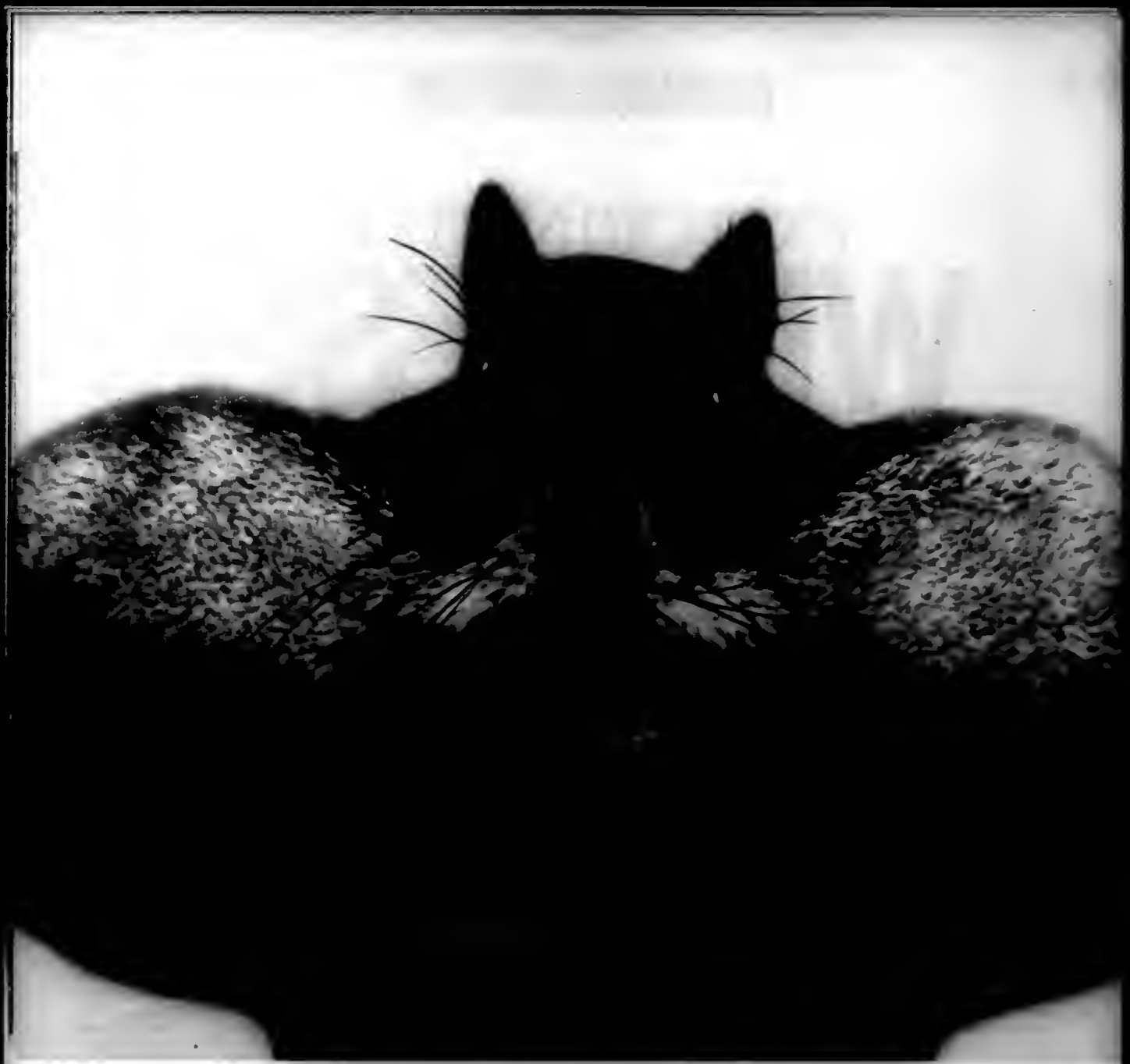
Privacy. This is becoming a growing concern, and it's climbing political and legislative agendas across the world. There has always been a tension between convenience and privacy, between access and control, and between personal service and anonymity in any telecommunications-dependent service. E-commerce has increased that tension. Mobile commerce will increase it even more because of FCC regulations and business applications that track the locations of subscribers. Any IT professional must become knowledgeable about privacy in terms of technology issues, best practices and the law.

Taxation. Within the next three years, taxation will be a key IT planning issue. In the U.S., the issues will center on legislation, state and local taxes vs. federal taxes, and collection. Internationally, a trade war is coming. The huge international imbalance in e-commerce purchases means more goods and services will be sold out of the U.S. Europe wants to collect a value-added tax of, typically, 18% at the buyer's end. The U.S. will favor collection of a 5% to 10% sales tax at the seller's end. So, expect the next massive and complex software investments to center on tax collection.

Consumer protection. There are few precedents, established practices and laws to cover online business. There are growing reports of customers having problems resolving, for instance, the blocking of "opt-out" marketing procedures. In these situations, they're automatically billed for renewing a service unless they explicitly opt out in writing. But they can't get their letters to the people who can process the cancellations, and they can't get redress on incorrect charges or dispute transactions. In many cases, the troubles are caused by IT system design problems and poor handling of the business processes behind the system.

PETER G.W. KEEN is chairman of Keen Innovations (formerly The International Center for Information Technologies) in Fairfax Station, Va., a senior fellow of Differentis, a European [illegible]

IT will thrive or fail during the next few years on the diversity of its roles and responsibilities — and of its people and their skills. Diversity and creativity go together. The IT organization that doesn't take on these four issues as responsibilities is implicitly deciding to confine itself to too narrow a role to be central in managing technology's impacts, rather than just managing technology.



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EXPLORING THE WIRELESS WILDERNESS

ROUNDTABLE PARTICIPANTS, FROM LEFT:
Dan Glessner, director of enterprise marketing at Palm Inc. in Santa Clara, Calif.; **David Lambert**, telecommunications analyst at National Bank Financial in Toronto; **John Distefano**, vice president and practice director for the mobile commerce and wireless services practice at Cap Gemini Ernst & Young U.S. LLC in St. Louis; **Dan Black**, director of e-commerce systems at United NetWorks, a wholly owned subsidiary of United Air Lines Inc. in Chicago; and **Tracey A. Esherick**, executive vice president of online brokerage at Fidelity Investments in Boston.

PHOTOS BY CHERRY KIM
ILLUSTRATION BY FRANCISCO CACERES

Forget the hype. Which B2B and B2C mobile-commerce applications are really expected to succeed in the future? Experts weigh in on these and other wireless challenges facing corporate America in the latest chapter of *Computerworld* and *ebizChronicle.com*'s roundtable series. By Thomas Hoffman and Sarwar A. Kashmeri

Long before the dot-com bust, before the bull market ran back into the barn, just about everybody was predicting that wireless was going to be the next hot technology. And while some of the enthusiasm for mobile business has cooled a bit as companies have reined in their IT spending, many experts continue to believe that this arena is still in its infancy and that the commercial potential for wireless computing remains huge.

As part of an ongoing series of roundtable discussions co-hosted by Computerworld *and* ebizChronicle.com, *a group of IT executives recently got together in New York to discuss wireless issues such as privacy and security challenges and geographic disparities.*

Hoffman: *Which appear to be the long-term winners for mobile-commerce applications? Are there any killer apps out there?*

Glessner: A lot of our customers are using handhelds for horizontal applications like mobile office, which is e-mail, calendaring and scheduling. A second broad horizontal is in the area of CRM — customer relationship management — to provide better customer service and grow top-line reveoues.

Esherick: One of the things that prevents consumers from participating more here is that it's too tough to figure out which device to buy. I know; I have three [a PalmPilot, a Research In Motion pager and a cell phone].

I think the killer app is fixing that problem, making it much easier for people to select the device that makes sense for them. And consumers shouldn't have to know the difference between Web and WAP [Wireless Applicatioo Protocol].

Black: M-business isn't always about using a wireless device for financial transactions. It can include business efficiencies, sucb as the use of these technologies by a ground crew for an airline.

Distefano: I think trying to figure out what the killer app is is a bit of a scavenger bunt. There are a lot of workplace-type apps that are a good fit for untethered field workers. It's the ability to give real-time information in a sales situation. If I'm a maintenance engineer, if I'm a field service rep, [it's] the degree that I can know right then at the point of repair what the part history is, what kinds of maintenance have been performed on this device — whether it's an airplane or it's an expensive piece of medical equipment.

Lambert: One segment that we haven't looked at here is the device-to-device [market]. I think that's going to be an important part of the wireless sector. For example, this is a really simple app: a location-based security system, where you stick a little device in the car and a [security] company can track that car and get insurance companies to pay them for doing the tracking of stolen cars.

ROI

Kashmeri: *Is it possible to apply historical return-on-investment criteria against wireless investments? Should companies factor in these huge third-generation licensing costs?*

Esherick: Overall, we view this as part of doing business. And while it'a a new, leading channel now, I think it's going to eventually be just like 800-number service was; it'a going to be a cost of doing business.

The reason we're in this space is customer service. Ideally, this will allow us to serve our customers better. When you talk to customers who are actively using these devices today, they love them — they absolutely love them. It gives them freedom, and it allows them to keep on top of things, and they're easy to use. [Wireless technology is] still not where we'd all like it to be, but it's a heck of a lot easier *to* use these than it is to log on to the PC sometimes.

Lambert: I cover one of the companies that was bidding on the U.K. wireless spectrum and won one of the licenses. And some of the reasons they gave me for paying so much for their license were that there are capacity constraints for voice [and] that it was a strategic move, because if you think you're eventually going to have voice over IP in the wireless segment, then new networks will be more efficient than the old networks. And you're capable of paying more for the spectrum if you're able to put in a more efficient network.

Glessner: Do historical ROI analyses apply to these multibillioo-dollar investments? From my perspective, the answer is absolutely yes. And Old Economy rules apply to this New Economy kind of situation, and the stock market has been bearing that out.

Distefano: On the topic of the hundreds of billions of dollars that have been spent [oo spread-spectrum licenses], I struggle with that. Right now, it's not necessarily an enviable position, but I guess these guys are a lot smarter about exactly where this market may be going than I might be. This is not an investment that should be measured or evaluated within a three- to five-year horizon. This is a 10-, 15-, even 50-year investment that they're making.

Black: The ROI is not black and white. Qualities like customer retention are more measurable by surveys than they are measured by financial execution transactions.

Wireless Wilderness, page 40

MOREONLINE

For a full transcript of our roundtable discussion of wireless technology, visit our Web site.
www.computerworld.com/wireless

The Moderators

Sarwar A. Kashmeri is publisher of *ebizChronicle.com*, a New York-based online daily newspaper covering business-to-business e-commerce.

Thomas Hoffman is *Computerworld*'s business features editor.

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EXPLORING THE WIRELESS WILDERNESS

Continued from page 37

Market Successes

Hoffman: *What are some concrete examples of mobile-commerce successes, either in the business-to-business or business-to-consumer space?*

Lambert: There's a company in Canada called Grocery Gateway, and they're basically a grocery ordering service where, pretty soon, you're going to be able to order your groceries over wireless devices. So while you're in your car, you're going to say, "OK, I need some milk and butter," and then use your wireless device to order them.

Glessner: Safeway in the United Kingdom is giving out Palm-powered handheld devices to their customers, with little magnets on the back of them to put on their refrigerators. As people go through the orange juice carton or the milk carton, they just tick off [that they'd] like the MinuteMaid or whatever the brand is. And this gets transmitted wirelessly to the Safeway store. Am I more likely to stop off at Safeway to pick up the groceries that they know that I want, or would I stop off somewhere else to buy food on the way home? Safeway's bet, of course, is that this is a great customer-retention opportunity.

Fiat in France is using handhelds to automate and improve the whole buying process for cars. And we all know how pleasant that is. But they're basically trying to provide the salespeople with all the information about promotions and financing and options, so they never have to leave the customer for any period of time and they can always answer all their questions.

On the B2B side, *The Atlanta Journal-Constitution* uses handhelds to automate the newspaper delivery process, where drivers touch the screen and see that they need to deliver the morning newspaper to the second house on the left, touch it again, drive two blocks, make a right turn, deliver the evening newspaper to the third house on the right.

Distefano: One good example is one of the largest trucking and transportation companies in the U.K. They looked at their operations and realized that they've got somewhere between 20% and 28% of their vehicles on the back haul [from a delivery] that come back empty. They said, "How can we take advantage of that excess capacity?"

So what they've done is basically create a marketplace that allows shippers [to] bid on the ability to move that gear. So if there's a two-pallet load in Manchester that needs to be moved to London, I've got two empty trucks there that just emptied out this morning. As a carrier, I can take what would have been unused excess capacity that was just going to make this drive back to London totally empty, bid on that deal, get it within minutes because it's a real-time auction, load up the gear and drive it back.

Key Challenges

Kashmeri: *What are the key challenges organizations face in rolling out mobile-commerce applications? Privacy and security issues? Skills shortages?*

Eshorick: One of the biggest challenges is that I'm not sure we're thinking big enough, speaking for Fidelity. I think that there are so many possibilities with some of the new technology that even the experts can't envision how it can make people's lives easier. So I think one of our challenges is to be thinking far enough out so that we can really get to the killer app or get to that next service or oext revenue stream or whatever it is.

Glessner: One of the big challenges companies are facing is how they cost-justify a lot of these wireless investments. Enterprises are struggling with that and so they are obviously just looking to begin witb the highest-ROI projects. There are a lot of converging technologies as well. So having systems integration capabilities is very important. There's also a multitude of devices right oow: cell phones, WAP phones, handhelds, laptops. So enterprises are struggling witb "How do I support, how do I manage, how do I get out this enterprise information to a multitude of devices? And how do I do it securely?"

> One of the big challenges companies are facing is how they cost-justify a lot of these wireless investments. Enterprises are struggling with that.
>
> DANIEL GLESSNER, DIRECTON OF ENTERPRISE MANKETING, PALM INC.

Distefano: Another big challenge is that the life cycle of new technology is now less than the life cycle of delivery. So we start a six-month project, [and] there's a new device. Are we outmoded as soon as we launch? That's extreme, but still, there's an issue there — there's a challenge there that we have to think about from a technology and infrastructure perspective.

Black: How does this compare to other business priorities? The Internet is the bread and butter right now. How much time and energy do you put into this wireless stuff that's really on the edge of adoption? You've got to put some effort into it, because you don't want to be left behind. But at the end of the day, where's your bread and butter? It's not here. My point is, where do you draw the line?

This roundtable was a joint effort of Computerworld *and* ebizChronicle.com, *an online daily newspaper covering business-to-business e-commerce.*

In Search of IT's Dual Degrees

So-called techno-MBAs – degrees that combine a traditional MBA program with a heavy dose of technology – have risen to the very top of many recruiters' wish lists. By Jill Vitiello

LOU ANN SANTALONI

FRANK SKINNER put his career on hold to go back to school to learn how to combine business understanding with technology know-how.

WHAT'S BETTER than an MBA? A so-called techno-MBA: an MBA with a concentration in information systems or e-commerce, or even dual degrees that yield two distinct diplomas — an MBA and a master of science in IT — upon graduation.

"The CEOs and hiring managers we've interviewed tell us they would kill for this kind of MBA talent," says Louis E. Lataif, dean of Boston University's (BU) School of Management. BU will admit its first class of 100 full-time MS/MBA students in September.

According to Lataif, in the 1960s, only about 4,000 students graduated from business schools each year. Last year, 105,000 students in the U.S. earned MBAs.

Michelle Guldalian, a senior analyst in the IT services group for the city of Philadelphia, will complete her MBA with a concentration in MIS this spring. She began the program at Temple University in Philadelphia in 1997, attending part time at night and paying the tuition herself.

With that kind of motivation, she will likely meet her next career goal of working as an IT consultant at one of the major consulting firms.

"Temple gave us a lot of practical application," says Guldalian. "We worked on projects in cross-functional groups, just like we do in the real world."

Temple recently revamped its graduate school programs to meet the needs of a student population that's increasingly interested in adding proficiency in IT to traditional business studies. Part-time students can now choose an MBA with either an MIS or e-business concentration, or a master of science in e-business, which is a post-MBA program. Full-time students can pursue an MS/MBA in e-business.

Competitive Edge

Last September, Frank Reynolds, who already has an MBA and a master of science degree in psychology, began earning his master's degree in e-commerce at Temple.

"I need to get the competitive edge over my peers," says Reynolds, a document production marketing executive at Xerox Corp. in Philadelphia. "E-commerce is at the forefront for the business decision-makers of the future."

In addition to working full time and studying part time at Temple, Reynolds and several of his fellow students formed an e-commerce think tank that hosts a Web site and does pro bono project work.

But Reynolds' model isn't the only one available for ambitious IT professionals who want to speed their climb to the senior ranks with a dual-edged degree.

Frank Skinner was employed for several years at a company where he was responsible for integrating manual processes with information-tracking systems.

"I saw that workflow issues were just part of a larger problem with business in general," says Skinner. "I wanted a solid foundation in effective IT implementation so I could deliver proper solutions to clients."

He left his job and entered the demanding full-time MIS/MBA program at the University of Alabama in Tuscaloosa. To survive the temporary loss of income, Skinner banked sales commissions while he was still working. While enrolled in the program, he obtained loans, lived frugally and worked on campus.

Most important, Skinner had the support of his wife, Kim, who was willing to work full time while her husband attended school. A paid summer internship at Memphis-based FedEx Corp. helped ease the financial burden.

Return on Investment

The career time-out paid off. In December, Skinner was offered a job by Chicago-based Andersen's business consulting group. He starts work in Charlotte, N.C., upon graduation this spring.

"Based on what I have learned and experienced here, I have set a course to make a real impact for my clients," says Skinner. "I see my career progressing to the level of partner or CIO."

Challenging work, a dynamic culture and executive education opportunities at Andersen attracted Skinner to the company.

"Every time you achieve a promotion, there's a training program to help you get ingrained in the skill sets you'll need to take on the new responsibilities," Skinner says. He's already looking forward to continuing his professional development at Andersen, he says, with company courses in project management, client relationships and leadership.

Vitiello is a freelance writer in East Brunswick, N.J.

Dual-Degree Sampling

The following schools offer techno-MBAs:

Carnegie Mellon University

Pittsburgh-based Carnegie Mellon's renowned computer science school grew out of its business school, which was the first to have a computer. The ties between the two schools are still strong.

"Last year, we added a concentration in e-commerce to our MBA program, and in one year, it became the second most popular," says Fallaw Sowell, deputy dean and director of the MBA program. "The first is finance; the third is strategy, which had been No. 2 for the past few years."

Boston University

BU's MS/MBA program is built on the school's past success with dual-degree programs. Its MIS/MBA, which was structured for future CIOs and chief technology officers, will no longer be offered.

"The MS/MBA is designed for the highest-aspiring MBA who intends to be a leader and make an impact on society," says School of Management dean Louis Lataif. "They need more than a general MBA can offer and more than those that throw in e-business."

Rutgers University

Widely known as a public Ivy League school, New Brunswick, N.J.-based Rutgers offers an MBA with concentrations in areas such as pharmaceuticals, arts management, e-commerce and supply chain management.

"Supply chain management is a major focus of curricula development at all the Ivy League and leading state universities and is very much tied to e-business success," says David Muha, a spokesman for the Rutgers Graduate School of Management.

Bentley College

Counting itself among the top 10 IT-oriented schools, Waltham, Mass.-based Bentley College will introduce a dual degree known as the MBA/MSIT, according to Don Chand, director of the program. Bentley already offers the MSIT degree alone.

– *Jill Vitiello*

Proxy reports show that these IT execs have made it big, with salaries and bonuses that put them in the corporate elite. By Kim S. Nash

Major-

INVESTIGATION

A YOUNG FIELD COMPARED with finance and operations, IT has climbed the corporate respectability scale in recent years. But not everywhere.

Just 46 of the Fortune 1,000 companies rank and pay their CIOs on par with the very top corporate officers, according to an exclusive *Computerworld* study.

This despite the corporate rhetoric that a business is only as good as its IT.

The Securities and Exchange Commission (SEC) requires companies to report in annual proxy statements the compensation of their CEOs and the next four or five most highly paid officers. *Computerworld* ranked the CIOs included in the latest proxies for the 1,000 biggest companies in the U.S. (see chart).

Star treatment for the 46 elite CIOs includes fat retention bonuses, car allowances, low- or no-interest loans and lucrative stock packages. There are several millionaires in the group. And at least 16 CIO heroes made more than the chief financial officers at their companies last year, signaling that IT at those companies has lost its cost-center stigma.

Still, the fact that less than 5% of Fortune 1,000 CIOs made the proxy statement "means the CIO isn't of the stature everyone thinks he is," says Victor Janulaitis, CEO of Janco Associates Inc., a management consulting firm in Park City, Utah.

Even among the big-league CIOs in the *Computerworld* ranking, 29 — more than half — made less last year than the CFOs at their companies.

More companies than ever demand that CIOs help set strategy and make business goals come true. But that authority isn't always reflected in the executive order, says Wayne Sadin, CIO at Bank United Corp. in Houston.

"There are barnacles encrusted around the thought processes at companies," says Sadin, who is ranked No. 14 and reports to the bank's CEO. "I consider myself very lucky."

Five of the top 10 CIOs come from financial services firms, an informatioo-intensive field that often leads IT trends. "Hopefully, they will pull others along," says Patricia Wallington, president of CIO Associates, a consulting firm in Sarasota, Fla.

She says the individual is what matters most in whether a CIO can make the top echelons — not so much any corporate philosophy on the value of IT. When a long-standing, top-ranking CIO quits, his successor doesn't automatically get comparable status or pay.

For example, in 1999, Robert Logan, then 62, retired as CIO at J.B. Hunt Transport Services Inc., a $2.2 billion trucking company in Lowell, Ark. But his replacement, Kay Palmer, then 36, didn't get the same status. Logan was an executive vice president; Palmer is one rung down as a senior vice president. Palmer didn't make the company's latest proxy, either.

Seniority, style of communication, mind-set, breadth of viewpoint — these are as important as knowing how Unix works or how to negotiate with Microsoft Corp. "You don't want to sit in a board meeting and make picky little techie comments," says Wallington, the legendary former CIO at Stamford, Conn.-based Xerox Corp.

There's a difference between a boardroom-caliber CIO and an IT manager. "The IT person often thinks that when the project is done, IT is done," says John Boushy, CIO at Harrah's Entertainmeot Inc. in Las Vegas (No. 8 on the list). "Wheo I was solely looking at things from an IT perspective, I'd he frustrated from time to time about why IT wasn't more respected."

Boushy, 46, has been at Harrah's for 22 years. He started in IT, then spent four years as a special strategist to the chairman and another seven in high-level marketing. His time outside technology, he says, taught him how to be an executive-suite CIO.

"People at a senior level take responsibility for project outcomes. They hold themselves accountable to whether the business improves," he says. "A CIO has to do that."

The Top 25

Recent proxy statements for the Fortune 1,000 revealed the following compensation figures for last year. Only CIOs mentioned in proxy statements are included.

						2000 SALES	2000 PROFITS (LOSS)
1	**Leslie Tortora**, Goldman Sachs Group Inc.	$600,000 *	$6,943,900	$1,879,566	$9,423,466	$33.0 billion	$3.1 billion
3	**Dennis Jones**[1], FDX Corp.	$573,266	$345,267	$1,612,019	$2,530,552	$16.3 billion	$668.3 million
5	**Allen Gula**, Franklin Resources Inc.	$657,455	$812,683	$506,454	$1,976,592	$2.3 billion	$562.1 million
7	**Bruce Goodman**, Humana Inc.	$319,945	$270,000	$1,243,978	$1,833,923	$10.5 billion	$90.0 million
9	**Allan Woods**, Mellon Financial Corp.	$347,916	$468,750	$527,102	$1,343,768	$6.0 billion	$1.0 billion
11	**Kenneth Gerhardt**, ConAgra Inc.	$329,419	$372,200	$219,976	$921,597	$25.4 billion	$413.0 million
13	**Gerald Marrone**, Quest Diagnostics Inc.	$331,567	$282,300	$157,364	$771,251	$3.4 billion	$102.1 million
15	**Ronald Gaston**[2], Venator Group Inc.***	$400,000	$100,000	$227,572	$727,572	$4.7 billion	[$240.0 million]
17	**Richard Chapman**, Kindred Healthcare Inc.	$282,935	$390,886	$5,100	$678,921	$2.9 billion	[$53.6 million]
19	**Paul Ingevaldson**, Ace Hardware Corp.	$295,000	$85,550	$138,492	$519,042	$2.9 billion	$80.4 million
21	**Christopher Norman**, Herman Miller Inc.	$228,019	$244,772	$12,036	$484,827	$1.9 billion	$139.7 million
23	**Lisa Harris**, Staff Leasing Inc.	$227,885	$95,560	$149,500	$472,945	$3.1 billion	$604,000
25	**Robert Luminati**[3], Landstar System Inc.	$200,000	$205,000	$52,278	$457,278	$1.4 billion	$45.2 million

* Includes awards of restricted stock, payouts from long-term incentive plans and special compensation.
** Excludes value realized for stock options exercised.
*** 1999 compensation, from the most recent figures filed with the SEC.

[1] Retired June 2000; now chief operating officer and vice chairman at Commerce One Inc.; replaced by Robert Carter.
[2] Resigned May 2000; CFO Bruce Hartman has added CIO duties.
[3] Resigned May 2001; replaced by Larry Thomas.

League CIOs

The Top 25

Recent proxy statements for the Fortune 1,000 revealed the following compensation figures for last year. Only CIOs mentioned in proxy statements are included.

RANK	CIO, COMPANY	SALARY	BONUS	ALL OTHER COMPENSATION*	2000 TOTAL COMPENSATION**	2000 SALES	2000 PROFITS (LOSS)
1	**Leslie Tortora,** Goldman Sachs Group Inc.	$600,000	$6,943,900	$1,879,566	$9,423,466	$33.0 billion	$3.1 billion
2	**Francis Dramis,** BellSouth Corp.	$500,000	$701,500	$4,301,100	$5,502,600	$26.2 billion	$4.2 billion
3	**Dennis Jones**[1], FDX Corp.	$573,266	$345,267	$1,612,019	$2,530,552	$18.3 billion	$688.3 million
4	**Dawn Lepore,** The Charles Schwab Corp.	$521,667	$1,620,408	$9,894	$2,151,969	$7.1 billion	$718.1 million
5	**Allen Gula,** Franklin Resources Inc.	$657,455	$812,683	$506,454	$1,976,592	$2.3 billion	$562.1 million
6	**Jean Davis,** Wachovia Corp.	$374,167	$0	$1,462,702	$1,836,869	$7.3 billion	$832.3 million
7	**Bruce Goodman,** Humana Inc.	$319,945	$270,000	$1,243,978	$1,833,923	$10.5 billion	$90.0 million
8	**John Boushy,** Harrah's Entertainment Inc.	$359,981	$110,000	$1,291,463	$1,761,444	$3.5 billion	($12.1 million)
9	**Allan Woods,** Mellon Financial Corp.	$347,916	$468,750	$527,102	$1,343,768	$6.0 billion	$1.0 billion
10	**Michael Heschel,** Kroger Co.	$500,000	$361,620	$216,567	$1,078,187	$49.0 billion	$876.9 million
11	**Kenneth Gerhardt,** ConAgra Inc.	$329,419	$372,200	$219,978	$921,597	$25.4 billion	$413.0 million
12	**Thomas Koops,** BJ Services Co.	$245,840	$225,007	$318,928	$789,775	$1.6 billion	$118.0 million
13	**Gerald Marrone,** Quest Diagnostics Inc.	$331,587	$282,300	$157,364	$771,251	$3.4 billion	$102.1 million
14	**Wayne Sadin,** Bank United Corp.	$200,600	$250,000	$315,200	$765,200	$1.4 billion	$134.9 million
15	**Ronald Gaston**[2], Venator Group Inc.***	$400,000	$100,000	$227,572	$727,572	$4.7 billion	($240.0 million)
16	**William Seltzer,** Office Depot Inc.	$465,000	$75,000	$148,416	$688,416	$11.6 billion	$49.3 million
17	**Richard Chapman,** Kindred Healthcare Inc.	$282,935	$390,886	$5,100	$678,921	$2.9 billion	($53.6 million)
18	**Warner Schlais,** Deluxe Corp.	$214,583	$107,300	$241,554	$563,437	$1.6 billion	$161.9 million
19	**Paul Ingevaldson,** Ace Hardware Corp.	$295,000	$85,550	$138,492	$519,042	$2.9 billion	$80.4 million
20	**Brian Kilcourse,** Longs Drug Stores Corp.	$100,000	$135,819	$271,355	$507,714	$4.0 billion	$44.9 million
21	**Christopher Norman,** Herman Miller Inc.	$228,019	$244,772	$12,036	$484,827	$1.9 billion	$139.7 million
22	**Barbara Graham,** Conectiv	$262,500	$115,920	$98,596	$477,016	$5.0 billion	$170.8 million
23	**Lisa Harris,** Staff Leasing Inc.	$227,885	$95,560	$149,500	$472,945	$3.1 billion	$604,000
24	**David Gadra,** Ikoo Office Solutions Inc.	$290,000	$141,960	$31,834	$463,794	$5.4 billion	$29.1 million
25	**Robert Luminati**[3], Landstar System Inc.	$200,000	$205,000	$52,278	$457,278	$1.4 billion	$45.2 million

* Includes awards of restricted stock, payouts from long-term incentive plans and special compensation.
** Excludes value realized for stock options exercised.
*** 1999 compensation, from the most recent figures filed with the SEC.

[1] Retired June 2000; now chief operating officer and vice chairman at Commerce One Inc.; replaced by Robert Carter.
[2] Resigned May 2000; CFO Bruce Hartman has added CIO duties
[3] Resigned May 2001; replaced by Larry Thomas.

League CIOs

The transition creates a "constructive schizophrenia" at work, says Chris Miller, an executive director of the Corporate Executive Board Co.'s Working Council for CIOs, a management research group in Washington.

CIOs who are also senior officers help shape corporate strategy, but the old rules of better, faster, cheaper still apply. The best way to satisfy these sometimes competing interests is to install a standard, companywide IT infrastructure, Miller says.

Yet such projects are long and hard and tend not to have much support from business-unit managers, he says. "This is why CIOs want representation at the executive table," he says.

How did Sadin at Bank United know he had arrived? "When I saw my name and picture in the annual report. That was a big deal — and when you see yourself in the proxy," he said.

With higher stature come higher stakes. Once the CIO starts to pitch IT plans that influence the direction of a company, what goes right and wrong is much more obvious.

"What drives a lot of folks is fear of failure. I've never sat back and said, 'I've made it,'" says Bill Friel, 62, CIO at Prudential Financial in Newark, N.J. "If there's a job in American business with more pressure on a day-in, day-out basis and year over year, I don't know what it is."

Francis Dennis
BellSouth
2000 COMPENSATION
$5.5M

Top-tier CIOs also feel some vulnerability in their paychecks.

Between bonuses and stock options, well over half the pay package of top CIOs is linked not only to meeting individual and IT departmental goals but also to company performance. Did the stock price rise? Did expenses fall?

"That's appropriate," says Brian Kilcourse, 49, CIO at Longs Drug Stores Corp. in Walnut Creek, Calif. (No. 20). "I'm willing to be measured on the success of the company. You'd be amazed at how focused you get."

Al Gula, 46, CIO at Franklin Resources Inc., a San Mateo, Calif.-based investment firm, agrees.

Gula (No. 5) says more than half of his pay is tied to company performance. "If Franklin doesn't do well, my compensation can drop dramatically. We all work for the shareholder at the end of the day," he says.

CIO pay at this level can vary a lot from year to year, depending on how and when long-term incentives are bestowed. For example, Kilcourse will make $115,000 less this year than last year, according to company proxies, mainly because he'll be getting fewer stock options.

St. Louis-based D&K Healthcare Resources Inc. has a complicated formula for figuring stock awards for CIO Brian Landry (No. 44). He receives a certain number of shares based on where D&K falls in an annual health care company rating index.

John Lochow (No. 26) joined Tech Data Corp. in Clearwater, Fla., as CIO in February 1998. He was eligible for a $300,000 bonus simply for staying with the company until last June.

Overall, the go-go economy of the past two years helped create some CIO jackpots. But this year won't be as rosy.

No. 1-ranked Leslie Tortora at The Goldman Sachs Group Inc. last year received a $6.9 million bonus, more than 11 times her comparatively modest salary of $600,000.

Tortora, 44, is regarded as one of the most talented CIOs in the field, and her compensation reflects that. What's more, it is — to the dollar — equal to that of Goldman's CFO.

At the same time, the New York-based investment bank, which handled dozens of dot-com initial public stock offerings, made billions of dollars in profits in 1999 and 2000. That also boosted Tortora's pay.

Tortora was unavailable for comment.

Dawn Lepore
Schwab
2000 COMPENSATION
$2.2M

Bruce Goodman
Humana
2000 COMPENSATION
$1.8M

But this year's economic slowdown means that many CIOs will see a drop in pay, says Janulaitis.

When sales and profits fall, bonus dollars that might have gone to senior officers instead typically become retention bait for lower-ranked employees.

"This is the first recession we've gone into where CIOs are viewed as part of senior management," Janulaitis says. "They've gotten what they've wished for. Because of that, they're going to be paying the price in this downturn."

Dawn Lepore, CIO at The Charles Schwab Corp. in San Francisco, had a great 2000. Her $1.6 million bonus was three times her $522,000 salary.

In January, though, Schwab cut the salaries of its senior managers, including Lepore, 10% to 20% for two months, citing the sour economy. But to 47-year-old Lepore (No. 4), the move made sense.

"Compensation of executives should be aligned with the interests of customers and shareholders," she says. "If the economy shifts, is that fair? I don't think about it that way." ◗

MORE ONLINE

For the complete list of 46 CIOs in company proxies, including a comparison of their 1998, 1999 and 2000 compensation, visit our Web site.
www.computerworld.com/ciosalaries

Chief Internet Officers: A Fad About to Fade

At a few companies, the CIO is outranked and outearned by an Internet executive.

For example, AdvancePCS, a managed-care company in Irving, Texas, didn't include a CIO in its latest proxy statement. But the "vice chairman of e-business and technology" did show up (see chart).

First Union Corp., a bank based in Charlotte, N.C., actually eliminated its corporate CIO position last October. It then appointed David Carroll, a former regional bank president, to chief e-commerce and technology officer. Carroll made the latest proxy.

Though there were fewer instances last year than in 1999, various versions of the Internet officer position live on. But for how long?

"Pardon my French, but that [title] is a bunch of B.S.," says Victor Janulaitis, CEO of management consulting firm Janco Associates.

The positions are a fad destined to fade, Janulaitis says. "There will be a new 'chief something' in two years, and the chief e-commerce officer will get absorbed."

That's already begun. For example, Maryann Timon was senior vice president of Internet strategies at Genesis Health Ventures Inc. in Kennett Square, Pa. But the elder-care company didn't directly replace Timon after she retired in March 2000. Instead, it distributed her duties among other managers.

At least one e-commerce executive has moved up to a bigger, better spot.

Steven Mnuchin was global head of e-commerce at Goldman Sachs until February, when "co-CIO" was quietly added to his title.

At the same time, the company's existing CIO, Leslie Tortora, gained Mnuchin's e-commerce title in addition to her own.

They now have the same titles, but Goldman Sachs declined to comment on whether Mnuchin's compensation will match Tortora's, who holds the No. 1 ranking on the *Computerworld* list.

– Kim S. Nash

E-Compensation

A sampling of Internet-related senior officers

	2000 COMPENSATION
David Carroll Chief e-commerce and technology officer First Union Corp.	$1,531,824
Jerry Foreman Senior vice president of home goods, merchandising and e-commerce Service Merchandise Co.	$779,575
Jon Halbert Vice chairman, e-business and technology AdvancePCS	$527,692
Maryann Timon Senior vice president of Internet strategies Genesis Health Ventures Inc.	$461,324

SOURCE: COMPANY PROXY STATEMENTS

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Dear Career Adviser:

I'm a Microsoft Web applications developer (Microsoft Visual InterDev) with a background in Active Server Pages, Dynamic HTML and server-side data. I want to move into developing mobile/wireless applications. Given my background and the flux of the wireless industry, is this a good choice? — UPWARDLY MOBILE

Dear Mobile:

Wireless is here to stay. But out of approximately 1 billion Web sites, only about 1.5 million currently provide wireless content. So unless you want to develop PlayStation gaming applications for the I-mode telephone (a joint venture between Sony Computer Entertainment Inc. and NTT DoCoMo Inc.), developing software for wireless devices falls into two distinct camps: application/operating system design and support, and chip design.

The latter requires an intimate knowledge of embedded systems for wireless devices. This is different from your experience developing applications in Windows for the Web.

Even application-based development jobs within the wireless industry require you to write embedded software that's performance- and standards-oriented, says Peter Monahan, a San Jose-based staff engineer at Parthus Technologies PLC, a Dublin-based supplier of mobile Internet technologies. Today's wireless companies are judged by how tightly written and robust their code is, he says.

Therefore, the basics for developing wireless applications include knowing at least one of the five Wireless Application Protocol stacks. It also requires an understanding of emerging wireless standards such as XML, XHTML or even SyncML (the data transfer protocol promoted by all of the major wireless device manufacturers). And it requires knowledge of other wireless standards such as Bluetooth, which is a radio frequency electronic-communications equipment standard, and General Packet Radio Service technology.

Some firms in this industry are also suffering financial woes. Therefore, you might be better off working for an outsourcing company that provides development services to a number of device and semiconductor manufacturers, says Monahan.

Outsourcers that handle several standards and can quickly refocus development efforts are more apt to survive a downturn than firms that focus on a technology that fails to become a dominant standard.

Dear Career Adviser:

I'm a director-level senior technologist at a nationally reputed systems integrator. I have more than 12 years of IT experience, from mainframes to leading-edge e-business technologies. I've spent the past five years in consulting. I have an MBA and a master of science degree in MIS. My goal is to become a chief technology officer. Should I stay in consulting or seek a full-time executive IT job at a major corporation?

— TARGETING CTO

Dear Targeting:

Your answer depends on your areas of technical expertise, the current job market for your skill set as a consultant or a CTO, your compensation level and the time frame you have to reach your goal.

CTO jobs require significant business experience and full project management responsibility for a major systems implementation.

But if your technical skills are strong and you're working at a good firm, you're probably safer staying put and continuing to absorb new technologies.

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Your consulting venue could also become your ideal transition vehicle right into an in-house CTO job. Provided that you aren't violating any employment restrictions, try targeting your engagements toward companies you'd really like to work for. Then, once you're involved with a successful project, make your long-term goals delicately known.

Dear Career Adviser:

I'm a programmer who is joining a young company that is affiliated with a professional employer organization (PEO). What does this mean, and does it makes a company more vulnerable?

— PEO PLENTY

Dear PEO:

Many smaller and midsize companies set up PEO relationships, which can help them establish more professional and efficient human resources functions.

They also enable a company to participate in larger groups for better coverage and lower rates on employee benefits such as health insurance, says David Scharff, an administrative staff consultant in Walnut Creek, Calif. Such relationships are known as PEO or "co-employment" models and are legally recognized by all government agencies that regulate employers.

Payroll checks bear the name of both the client company and the PEO. But the client company retains full control of its business, including hiring, promoting and firing employees; setting pay rates; conducting performance reviews; and, usually, handling its stock option program.

Little Rock, Ark.-based Employer Services Assurance Corp. and the Alexandria, Va.-based National Association of Professional Employer Organizations can tell you if your potential employer is using an accredited PEO and what the standards are. ▶

BRIEFS

U.S. Tops E-Commerce Readiness Index

The U.S., Finland, Iceland, Canada and the Netherlands ranked highest in e-commerce potential among 47 nations, according to the "2001 World E-Commerce and Internet Market Report," released earlier this month by Meta Group Inc., a Stamford, Conn.-based IT research and consulting firm. The nations were ranked based on the amount of financial transactions they generated, literacy and education rates, market potential, globalization practices and technological sophistication. Sweden, Australia, Denmark, Ireland and New Zealand rounded out the list of the top 10 countries.

Heart Association Outsources Support

The American Heart Association (AHA) has chosen to outsource support of its off-the-shelf software to PC Helps Support Inc. in Bala Cynwyd, Pa. The Dallas-based AHA, which works to prevent heart disease and stroke through research and public education, uses applications such as Microsoft Corp.'s Office, Outlook, Project and Publisher.

Survey: Firms Plan To Trim IT Spending

Roughly one-third of business decision-makers plan to decrease IT spending to compensate for declining business performance, according to new research from Newton, Mass.-based Cahners In-Stat Group. More than 40% of those surveyed said they felt the economy had affected their businesses negatively. But more than half said they expect the economy and their businesses to pick up later in the year. The study also found that the top three areas likely to be affected most by planned increases in IT spending are computer hardware (46%), network hardware (39%) and computer software (39%). For more information, visit *http://instat.com/catalog/cat-oci.htm#oe0101ml.*

Beer Maker Turns to Streaming Video ASP

Anheuser-Busch Cos. in St. Louis recently selected Andover, Mass.-based application service provider (ASP) NaviSite Inc. as its exclusive streaming provider for live Internet broadcasts and on-demand video for its Budweiser.com site. NaviSite's StreamOS product is expected to simplify management of streaming content and allow Anheuser-Busch to monitor real-time online viewer statistics to measure return on investment, according to a statement.

TECHNOLOGY

HACK OF THE MONTH

Even as Israeli and Palestinian hackers continue to duke it out in cyberspace, a new conflict between Chinese and American crackers is now under way. *Computerworld* security specialist Deborah Radcliff warns that this could lead to collateral damage to U.S. businesses. ▸ 48

SECURITY JOURNAL

After discovering that his network receives more than 1.5 illegal access attempts per second, security manager Vince Tuesday starts to analyze the types of attacks. He finds that some are sophisticated, but fortunately, most aren't. ▸ 52

EXEC TECH

Many organizations need something better than passwords to authenticate users. A thumbprint-reading mouse and a wireless proximity sensor are interesting and useful options. ▸ 54

QUICKSTUDY

Cascading Style Sheets are a simple mechanism that allows authors to attach formatting information (such as fonts, colors, positioning and spacing) to HTML documents. Find out more in this brief primer. ▸ 61

STREAMING INTO THE ENTERPRISE

THE USE OF STREAMING MEDIA for corporate applications is taking off. About one-third of the 1,000 largest companies in the U.S. are using streaming Web-based media significantly, according to one analyst. But IT managers face several challenges in creating and implementing streaming media: They must decide what to outsource, know how to create content that's optimized for streaming, make sure internal streaming doesn't overwhelm network capacity and set end-user expectations for streaming media quality.

58

BRIEFS

Ford Chooses Storage Networks Suite

StorageNetworks Inc. in Waltham, Mass., announced that Ford Motor Co. has signed on as a customer for a suite of data storage management software. StorageNetworks said the services it's delivering to Ford include its STORos operating system; STORmanage, which allows IT managers to load-balance and pool storage resources; and its virtual storage portal software, which monitors a storage network and its devices.

Mobile Information 2001 Server Released

Microsoft Corp. last week announced that Microsoft Mobile Information 2001 Server has been released to manufacturing. The server gives remote users access to Microsoft .Net enterprise applications, enterprise data and intranet content. It also includes Outlook Mobile Access, which allows users to securely access their Exchange Server e-mail, contacts, calendar and tasks. In addition, the Mobile Information Server box includes Outlook Mobile Access, which provides access to Microsoft Exchange 2000 Server and Exchange 5.5.

The estimated retail price of this out-of-the-box application with the Mobile Information Server middleware is $75 per seat. The middleware alone costs about $15 per seat, according to Microsoft.

Novell Upgrades Account Management

At the Networld+Interop trade show in Las Vegas last week, Novell, Inc. announced an enhancement to Novell Account Management 2.1 software. The no-cost upgrade for existing users adds support for Windows 2000-based Active Directory networks. The upgrade synchronizes user accounts in Novell's eDirectory with those in Active Directory, manages Active Directory objects from within eDirectory and permits single sign-on for users.

DEBORAH RADCLIFF/HACK OF THE MONTH

We Have Met the Enemy and He Is Us

FOR THE SECOND TIME THIS YEAR, script kiddies using old tactics are bolstering their egos in the name of their countries. While Israeli and Palestinian hackers continue to duke it out in cyberspace, a new war between Chinese and American crackers is now under way.

The score as of last Monday: China, 1,031; America, 750. That's the number of compromised Web sites each side claims to have defaced with its patriotic messages — or forced off the Net altogether.

DEBORAH RADCLIFF is a *Computerworld* feature writer. Contact her at deborah_radcliff@computerworld.com.

Everyone knows these strikes are fairly inconsequential instances of Web graffiti and minor denial-of-service attacks by a bunch of script kiddies. But this little hacker war could escalate into full-scale distributed denial-of-service (DDOS) attacks against bigger businesses with better security. And it could also draw U.S. law enforcement authorities into international investigations that they want nothing to do with.

Let's start with the downstream effect on U.S. busioesses: On May 5, the National Infrastructure Protection Center (NIPC), a global reporting partnership between the FBI and the private sector, posted a new warning of a sharp increase in scans against Port 80 (an always-open port for Web traffic), through which attackers are installing DDOS agents.

You remember those pesky little DDOS agents secretly planted in small businesses and colleges over the Net that were remotely commanded to attack Amazon.com, Yahoo, eBay and others last year? As they are now, the agents were installed in organizations with the worst — or no — information security.

While the NIPC wouldn't connect this to the Chinese/American cracking, intelligence from the private sector reveals that these DDOS agents are being installed oo machines the Chinese crackers claim to have compromised.

"We contacted the victims oo the Chinese lists, and we've recovered a few tools placed on the victim machines — DDOS tools and a Perl exploit used to break into Windows NT Web servers through Port 80," says Ryan Russell, an incident analyst at SecurityFocus.com, a security intelligence firm in San Mateo, Calif.

Because DDOS attacks are so difficult to prevent, eveo U.S. businesses with more security protection than most are now at risk of losing online business the way Amazon, ZDNet and others did last year.

Now for the problems facing law enforcement. No way does the FBI want to escalate this script kiddie war into an international cyberconflict, contends Winn Schwartau, a well-known writer and lecturer on information warfare. Which explains why neither the NIPC nor the presidentially directed Critical Iofrastructure Assurance Office in Washingtoo would commeot oo the Chinese/American hacks.

"This is all new ground. There's no way to know if this script-kiddie war eveo fits into the spectrum of conflict, which in a pre-cyberworld followed a natural path betweeo diplomacy and kinetic conflict," Schwartau says. "Besides, law enforcement would have to track these things down to see who's at the end of them. And I can tell you, that's very difficult when the anonymity factor is maintained and the attackers are offshore."

Attackers from each couotry are covering their tracks by bouncing their attacks through servers in Korea, Russia and elsewhere to make finding them and retaliating nearly impossible.

About the only thing that can be done at this point is for businesses and other organizations to beef up their perimeter security, starting in particular with the Web sites of smaller companies and the .edu sites that are being defaced through an easy, 1-year-old patchable exploit called the Unicode hole, according to Russell. The Unicode exploit allows crackers deeper into a Web site by dropping the symbols %cl%1c.. ioto the address space.

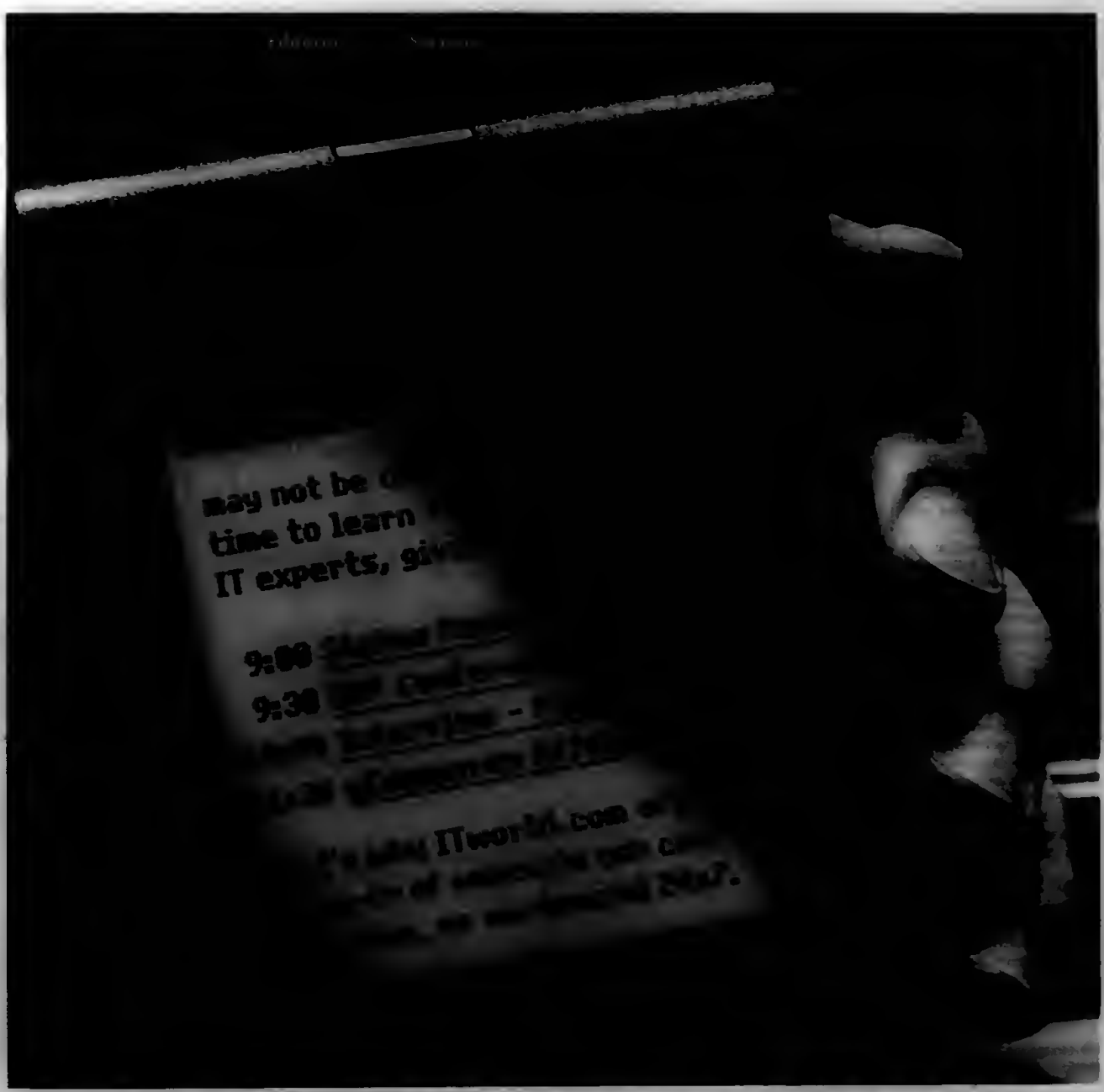
> This is all new ground. There's no way to know if this script-kiddie war even fits into the spectrum of conflict.
>
> WINN SCHWARTAU, WRITER AND LECTURER ON CYBERCONFLICT

Those companies that are already oo top of patches and filters should batten down their hatches in anticipation of DDOS attacks. Check your fail-over mechanisms and IP blocking/rerouting features in your filters (see the suggested reading list, below).

And by all means, crackers, chill out before this escalates into something bigger. The Chinese hackers claim more sites, but the U.S. hackers have hit much higher-profile governmeot, entertainment and telecommunications sites in China. So call it even, will ya?

Helpful Reading

- How to set up a DMZ: www.sans.org/infosecFAQ/firewall/DMZ.htm
- Information warfare: www.sans.org/infosecFAQ/infowar/infowar_list.htm
- Global alerts: www.nipc.gov/



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Compaq, RLX Technologies Launch High-Density Servers

BY LINDA ROSENCRANCE

Compaq Computer Corp. and upstart RLX Technologies Inc. are fortifying their positions in the battle of new high-density servers.

RLX, in The Woodlands, Texas, last week reached an agreement with IBM under which IBM will resell RLX's new high-density, low-power servers. IBM also agreed to supply some of the server components.

The RLX System 324 blade-type Web servers, which can be used by Web hosting firms and Internet data centers, will feature Santa Clara, Calif.-based Transmeta Corp.'s low-power Crusoe chips.

Earlier in the week, Compaq and chip maker Intel Corp. announced that they're building an ultradense server that offers more computing power but uses less energy, takes up less space and costs less than existing servers.

Compaq will use Intel's ultralow-voltage processors in its new hyperdense servers. The company said it expects to ship the servers, code-named QuickBlade, later this year.

RLX CEO Gary Stimac is a former Compaq executive. The company employs several other former Compaq workers.

Improved Storage

The new RLX server design will allow up to 336 server blades to be installed in a single industry-standard server rack, the company said. Currently, 42 servers can be stacked in one rack.

Compaq has said that 200 to 300 of its QuickBlade servers will fit in a single rack.

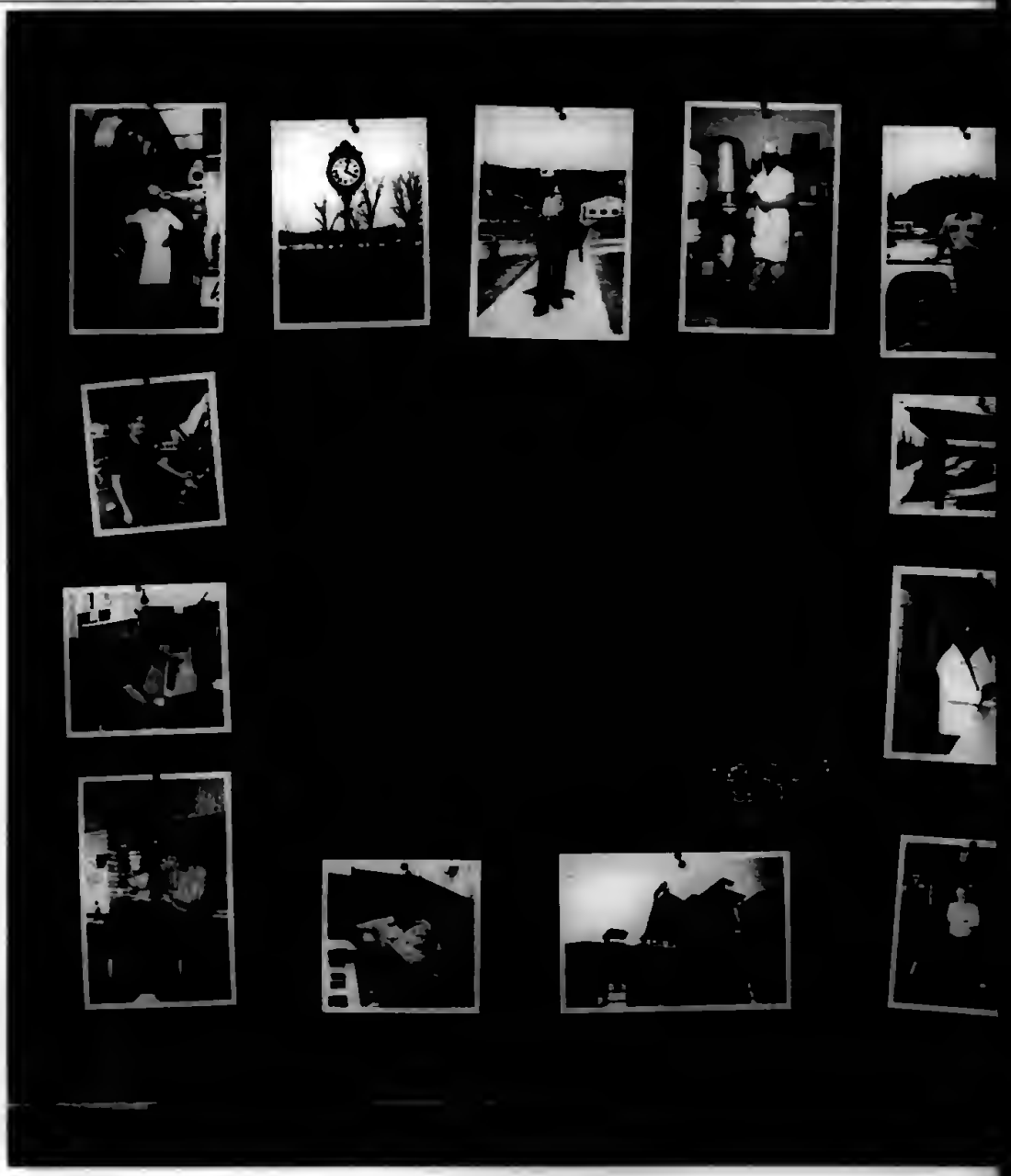
RLX said its System 324 Web servers aren't affected by the heat constraints of traditional servers. The company added that each server blade requires only 15W of power to operate, delivering five to 10 times the power efficiency of previous products.

The RLX System 324 chassis, preloaded with Microsoft Corp.'s Windows Web server software and other features, sells for $4,999.

Gordon Haff, an analyst at Boston-based Aberdeen Group Inc., said this type of server will be a big deal in the next 12 to 18 months.

"This is the logical next step from standard rack-mounted servers," he said. "The key to deploying them is [dealing] with the power and heat units.

"With the next generation of denser servers, [vendors] are realizing that looking at power and heat has to be an integral part of the design. They are basically building the systems from the ground up," Haff said.



VA Hospitals Test Smart Cards for Patient Information

BY JULEKHA DASH

The Department of Veterans Affairs (VA) is piloting a smart card that contains patient information and is expected to improve care and reduce administrative burdens for health care facilities.

Two facilities, one in Milwaukee and another in Iron Mountain, Mich., have been piloting the technology since last fall, according to Keot Simonis, director of veterans health administration in Washington. To date, 11,000 veterans have been issued the cards, and the VA plans to issue another 40,000 before the pilot program has ended.

Each 8MB card contains medical information such as a veteran's known drug allergies, the names of his next of kin and whether he has a living will. It also contains the patieot's health benefit information, including benefits provided by the VA network.

Simonis said the test facilities hope to minimize the time it takes to process medical information. The cards will let caregivers "emphasize the human component" of treating patients rather than spend time getting informatioo to fill out their paperwork, he said.

Io addition, veterans who move, travel or use more than one medical facility will save time by oot having to register at more than one VA hospital, said Simonis. Veterans can view and update their information at kiosks located in the hospitals.

An initial evaluation of the pilot program in December will help the VA determine how effective the smart cards are and whether the organization will expand their use to other locations. Simonis said he couldn't yet assess whether the 16MB cards have helped reduce medical errors and said he won't know until the VA completes its evaluation.

To protect patients' privacy, the health network has encrypted the data stored on the cards. A personal identification number is required to gain access to the information, said Simonis. Also, the cards can he read only at a VA health care facility. If the VA decides to expand its use of the technology, it might deploy a biometric device, such as a fingerprint scanner, for additional security, he said.

Smart card technology hasn't gained popularity among health care institutions because of a lack of standards, said Wes Rishel, an analyst at Gartner Inc. in Stamford, Conn. But Simonis said he believes that by piloting this technology, the VA will help set some of those standards.

Who's That Knocking At My Door? Go Away!

Every 1.5 seconds, someone tries to hack into Vince's systems. Fortunately, amateurs make most attempts

BY VINCE TUESDAY

ONE OF THE nagging problems in information security is the difficulty of finding out how many security incidents occur. Unfortunately, this information is difficult to obtain.

Companies fear the public relations and share-value impact of disclosing a security breach. Perversely, revealing even an unsuccessful attack can be a public relations disaster. And once an organization announces that it has been attacked, it may suffer further attacks as a result of the news coverage.

SECURITY MANAGER'S JOURNAL

For other crimes, we can use police statistics or insurance claims data to measure the change in risk over time. Currently, however, there isn't much of a market for cyberinsurance, so insurance data isn't available. Police data isn't much better because companies are hesitant to report computer crimes. Some distrust the police, believing them to have a low level of awareneas of computer security issues. Laws like the Freedom of Information Act and the low rate of successful prosecutions add to this distrust.

But companies can't hide everything. The highest-profile attacks in the current environment are Web site defacements. A useful resource in this area is Attrition.org's Web site. Hackers notify this group when they deface a site, and Attrition.org makes a mirror copy of it as a record. This means it has accurate data reflecting trends in this area. And the current trend isn't good. Attrition.org's Web site is seeing about 30 defacements per day, an increase from 13 per day a year ago and two per day two years ago. And it doesn't look like this will improve anytime soon.

To supplement this data from the outside world, we also regularly examine data from our systems to ensure that our defense is properly focused. We have an intrusion-detection sensor outside the firewall that logs many attacks, and we also log a great deal at our firewalls. As an exercise, we recently analyzed a week's worth of data down to the last packet and noticed some remarkable treods. I hadn't looked at this data in detail for some time, and I was startled by what we found.

My company was an early adopter of tbe Internet, so we have a large address range. This means that if an attacker picks an address at random, we have a 1 in 65,000 chance that we'll be the target. We are a major financial organization, making us a possible target of choice for directed attacks.

So, given all that, how many attacks and probes do you think we detect? One per month? One per day? I thought the result would be something in the range of once per hour. My research uncovered a much higher figure: We detected 1.5 attacks every second.

Of the non-Web connections (such as Domain Name System, File Transfer Protocol or e-mail), 85% were unauthorized, consisting of attempts to gather information or compromise our systems. Our firewall or our intrusion-detection system blocked these unauthorized connections — no doubt a few of them were errors caused by people mistyping IP addresses. It's also possible that some much more competent attacks penetrated our outer shell.

The most popular attacks are those that use scanning tools to target known vulnerabilities. The top attacks in our sample week were DNS BIND buffer overflow probes (379,273), Back Orifice probes (64,932), WU-FTP buffer overflow probes (64,824) and NetBIOS share name probes (38,285).

From the perspective of an attacker, the DNS and FTP attacks make a certain amount of sense. Recent high-profile, easy-to-exploit problems have been discovered in these servers that some companies haven't yet patched. Exploiting these problems can give the attacker root access to critical servers.

But the next two? These include some foolish attacks by obviously unskilled individuals. To run a scripted attack doesn't take very much skill, but at least you're trying to break into a system on your own behalf. Those that scan for Back Orifice and SubSeven Trojan horse programs are bottom feeders.

These are script kiddies that are too lazy to break into systems themselves but are looking for systems that other people have already broken into and left back doors into. Does this ever work? Anyone with even the most simple firewall will have blocked attacks to these ports, and all antivirus software detects and protects against these tools.

The volume of these probes for pre-broken systems is worrying — surely, these kids must sometimes succeed, meaning that there must be many machines with Back Orifice or SubSeven running, leaving them open to the least competent hackers. If someone were to try the real-world equivalent of these four scanning attacks — checking each car in a lot to see if it is unlocked by trying every door — someone would surely notice, and the perpetrator would almost certainly be warned off. The brazenness and sheer mass of these attempts show that these attacks aren't being noticed or that when they're reported, no effective action is being taken.

This doesn't bode well for the future of the Net. More and more people are coming online, often without sufficient security protection. Within a second after a Web site goes online, strangers are trying to break into the systems. Users may expect that law enforcement will protect them from malicious strangers, but no such protection exists at present. Indeed, once a machine has been hacked, even if users become aware of the intrusion, they may find fumigating their machines difficult.

What can we as security professionals do to deter this behavior? I welcome your thoughts in the Security Manager's Journal forum. ●

THISWEEK'SGLOSSARY

Freedom of Information Act: This law makes information more accessible to the public. That's great if you want to find out what the FBI had on Elvis (*http://foia.fbi.gov/presley.htm*) but not so great if you call in the FBI for help. Anyone can get the details of your security setup and how you were attacked.

SubSeven: A Trojan horse program that masquerades as a seemingly innocuous executable e-mail attachment. Once launched, SubSeven allows complete remote control of a computer. An attacker can access or destroy files, steal account information and generate denial-of-service attacks - all without the user's knowledge.

Information Sharing and Analysis Centers (ISAC): These centers were set up by President Clinton to promote sharing of threat and incident data within industry sectors. For example, the ISAC for financial services is at *www.fsisac.com*.

LINKS:

www.attrition.org: This security Web site keeps mirror images of Web site defacements. For an example, see this Department of Justice hack: *www.attrition.org/mirror/attrition/1996/08/18/www.doj.gov*. Many military sites have been replaced by tags like this one. *www.attrition.org/mirror/attrition/2001/03/31/mailserver.tci.navy.mil/*.

www.dshield.org: Need to see if a given IP address is attacking just you? Look at what other people are seeing at this Web site.

MORE ONLINE For more on the Security Manager's Journal, including past journals, visit www.computerworld.com/securitymanager.

● This week's journal is written by a real security manager, "Vince Tuesday," whose name and employer have been disguised for obvious reasons. It's posted weekly at *www.computerworld.com* to help you and our security manager better solve security problems. Contact him at vince.tuesday@hushmail.com or head to the Security Manager's Journal interactive forum.

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Making Passwords Passé

Good security has to balance inconvenience against effectiveness and cost. Two new devices handle this problem well. By Howard Millman

U-Match BioLink Mouse

ADMINISTRATORS face the unenviable task of designing security systems that meet their firms' needs but don't irritate users. So they try to balance effectiveness against convenience. While the two goals are mutually exclusive, new biometric products narrow the gap between them.

When selecting a log-on security system, you have to rely on one or more of the three authentication possibilities. You can base it on something users know (such as a password), something they have (like a token or smart card) or something physically unique about them (a biometric).

Passwords are cheap, plentiful and insecure. Tokens are handy but expensive and easily misplaced or stolen. Biometrics, which measure physical attributes with iris-scan, voice-recognition or facial-recognition devices, are usually costly and complex or affordable and unreliable. However, fingerprint scanners are a bright spot in this mostly dismal state of authentication strategies.

U-Match BioLink Mouse
$120

BioLink Technologies International Inc.
Miramar, Fla.
www.biolinkusa.com

Last year [Exec Tech, March 27, 2000], I tested a stand-alone fingerprint scanner that provided an affordable combination of security and convenience.

BioLink's recently released U-Match mouse takes the concept one step further. This $120 mouse contains a built-in thumbprint scanner and provides log-on security with no extra hardware on the desk.

It can be used for a stand-alone PC, but IT departments will be interested in BioLink's forthcoming server software, whose centralized administration speeds enrollment and helps assure compliance with security policies.

This server system and the U-Match mouse could reduce and maybe even eliminate password-related calls to the help desk. That alone might justify the server's cost of $3,500 for 50 seats.

BioLink says its mouse, unlike some older fingerprint readers, can't be fooled by Silly Putty imprints or cellophane-tape impressions of the thumbprint. In fact, the U-Match mouse can even tell if your thumb is still connected to the rest of you. I chose not to test this feature.

Despite its comfort and ease of use, the biometric mouse still adds a few seconds to the sign-on process. It can take even longer if it doesn't immediately recognize the fingerprint, as can happen when the thumb isn't aligned exactly.

And that's a problem. The possibility of a false negative is the reason nearly all biometric products need a secondary, overriding mechanism — and most opt for a simple password.

Unfortunately, having an alternate log-on procedure creates a real problem: Once the novelty of using the fingerprint wears off, users often routinely use just the password. For stand-alone use, typing ctrl-alt-delete can bypass the fingerprint scan.

In the server-based version, due for release in the second half of this year, administrators can centrally administer password access. Other centrally administered biometric products, including the XyLoc system below, allow only administrators to enter password overrides. I think that's better than letting users enter a password anytime.

XyLoc

XyLoc
$179

Ensure Technologies Inc.
Ann Arbor, Mich.
www.ensuretech.com

XyLoc is a wireless proximity system that uses a credit-card-size device carried by the user as well as a Universal Serial Bus-connected radio-frequency transceiver connected to the PC. The card activates the transceiver, which notifies the software to complete the log-on.

XyLoc's real value is that it automatically locks down the computer whenever the user leaves the sensor zone. No special action is required. When the user returns, the machine automatically unlocks itself. This solves the problem of staffers walking away from their desks and leaving their machines running and unprotected. This behavior makes XyLoc ideally suited for health care or retail organizations, where staffers tend to move around.

The device worked well in my tests on PCs running Windows 98 and Windows 2000, consistently unlocking and locking the PC as I entered and left the room.

One potential problem with XyLoc is that simple possession of the card allows access to the machine and the network. And proximity cards, like one-time-password tokens, are likely to be misplaced or left lying around. Guarding against this requires using a password along with the card.

Finally, if a user leaves his XyLoc card at home, provisions must be made for a loaner or temporary bypass.

XyLoc could be an ideal product to help travelers secure their laptops but not in its present form. About the size of a thick audiotape, the transceiver is just too bulky to carry easily. Ensure is currently developing a more compact, Bluetooth version, which can be embedded in a laptop or even a cell phone. It's due in two months and, I believe, it's well worth waiting for.

Millman is a freelance writer in Croton, N.Y.

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GETTING TO THE Root OF THE Problem

Automated network management software — sophisticated stuff that promises an unprecedented ability to monitor a corporate network — is oo the horizon.

But skeptical IT managers say the tools still aren't smart enough. They want artificial intelligence that can diagnose a network problem and get it right at least seven out of 10 times.

Such automation relies on event correlation and root-cause analysis tools. The concept behind the tools is simple: keep track of network devices and relationships, automatically fix minor problems and refer more complex snafus to the network manager.

But skeptical IT managers are demanding proof of better automation, bedrock interoperability and broader usefulness before they will buy such tools.

"We've looked at these tools," says Tom Revak, domain architect at pharmaceutical company GlaxoSmithKline PLC in Research Triangle Park, N.C. But "until the artificial intelligence exists that can automatically update a dynamically changing network, it's just one more pretty little map of what could be."

Historically, users have been "skeptical that software can meaningfully achieve what human expertise has achieved," says Dennis Drogseth, an analyst at IT consultancy Enterprise Management Associates Inc. in Boulder, Colo. Drogseth researched and wrote the consultancy's report on root-cause analysis and event correlation that was released in December.

Users have viewed automation for root-cause analysis and event correlatioo as "more work than it's worth, requiring too much labor and knowledge for rules to be appropriately defined for a specific environment," says Drogseth.

Exactly, says Kristina Victoreen, senior network engineer at the University of Pennsylvania in Philadelphia. "We tried building oo the autodiscovery that Spectrum does, but we spent more time fixing what it had discovered," Victoreen says. "The guys who do [the model building] found it was quicker to build the topological model of the network by hand, which is very time-consuming." Spectrum is a management tool from Aprisma Management Technologies in Durham, N.H.

The tools "need to sense when something out of the norm occurs, such as a critical deadline that forces people to work around the clock, and oormally noncritical failures become critical and require immediate response," says Revak. "If they can't do this automatically, the administrative overhead greatly outweighs the return oo investment."

The moment of truth for users seems to come when the software tools "can successfully automate problem diagnostics 70% of the time or better," Drogseth says in the report. At that point, "users believe they are justified in the investment.

"That 70% mark is being met today by most of the better products," Drogseth says.

The benefits can be substantial, be says: smoother-running networks, better service-level delivery, reduced staff requirements and lower overhead. These benefits, together with advancements in the software and a reduction in the costs of deployment, are driving an increase in the use of root-cause analysis and

event-correlatioo tools, Drogseth says in the report.

"There's oo way we could manage without it," says Chris Vecchiolla, IT project manager at Royal Caribbean Cruises Ltd. in Miami. Each of Royal Caribbean's 18 ocean liners has an IT staff of two people, but most systems management is bandled remotely from Miami via satellite.

Royal Caribbean uses Compaq Insight Manager and Unicenter from Islandia, N.Y.-based Computer Associates International Inc. to manage and monitor "about 170 items, such as SCSI card failure and out-of-thresbold notices on servers," Vecchiolla says.

Escalating alarms nntify both nnboard and Miami-based IT staffers of problems. When the system detects a virus, it autnmatically destroys it and notifies onboard IT staff of the action via a banner on a monitnr, Vecchinila says. But should a server exceed a predetermined threshold, Miami staff could be paged tn handle the problem, he says.

Because Royal Caribbean's ships cruise around the globe through every time zone, remote management from Miami sometimes occurs while onboard staffers are off-duty. When the Miami staff works nn a ship's systems, "Unicenter automatically picks it up and generates a banner that goes tn the nnboard systems manager that tells them the date, time, workstation accessed, what was dnne," Vecchinila says. "The [onboard IT staffers] like that a lot."

Drogseth says that more than half of the enterprise-level companies with which he spoke are beginning with autnmation's "lowest common denominatnr, alarm deduplication."

If a server goes down, each attempt by any user or device tn access it can generate a separate alarm, which doesn't describe the root cause of the problem. Deduplication lets a network manager see a single, server-down alarm instead.

A Kansas City, Mo.-based unit of Boston-based financial services company State Street Corp. isn't dning root-cause analysis, but it does use Spectrum for alarm deduplication, says David Lembke, State Street's network services manager.

The University of Pennsylvania has been using Spectrum for five years to reduce the oumber nf alarms reported by a single event, Victoreen says. "It works reasonably well, assuming we've built the model correctly," she says. But "it turns out [that] a big map with red dots flashing to show alarms is not that useful fnr us."

Drogseth says that in his interviews with 40 mid-size to large companies, most IT managers said they know they must start autnmating, because networks have grown too large and complex to manage without automation tools.

Though Revak is skeptical, "that's not to say we're not interested," he says.

"We're rethinking trying tn model all of our networks and maybe moving to trap aggregators nr event correlation engines," Victoreen says.

IT managers are looking beyond the network focus that most vendors have stressed and are seeing extended uses for the tools, such as to support performance, help desk functions, inventory and asset management, change management, and security. Not all tools support all such extensions, Drogseth says.

Vendors nf most of the tools also claim some kind of predictive capabilities.

A network that learns over time can not only help prevent problems, but it can also increase job satisfaction by releasing IT staffers from grunt work and calling nn them nnly fnr more difficult questions.

But where most such artificial intelligence efforts fall short is in detecting subtle changes, Revak says. "Through repeated small changes, the norm [can] shift very near the failure point, setting up a significant failure situation for the next small deviatinn from the newly established norm," he says.

Predictive capabilities vary greatly, and not all are based on sophisticated artificial intelligence techniques, Drogseth says.

At the bottom nf the range is basic linear trending. An algorithm can determine how long it will take a server to reach capacity if usage increases by, say, 20% per month.

At the other end are sophisticated tools like CA's neural network-based Neugents, Drogseth says.

A Neugent can look at historical data about netwnrk resource usage and a company's business cycle, says a CA spokeswoman. By aggregating and correlating data on oetwork infrastructure and business relationships, the Neugent might predict that a server would reacb capacity in six weeks but drop back to 30% in the seventh week, she says.

Royal Caribbean plans to implement CA's Neugent for Windows NT networks, which "will take us to another level of management," Vecchiolla says.

Before the root-cause analysis industry achieves that new level nf management, however, it must hurdle the stumbling block of standards, Drogseth says.

Part nf why the University nf Pennsylvania isn't "getting as mucb back as we'd hoped for is that we have a lot of different software from different vendors, and they have a lot of different proprietary schemes and interfaces," Victoreen says.

"The systems management industry must develop the standards and interoperability capabilities required for the tools in the event, problem, change, configuration, inventory, workload management, capacity [planning], performance [monitoring] and security areas to work together," Revak says. "Each of these disciplines contains some part of the overall equation."

Root-cause analysis and event-correlation tools aren't layered ontn a network so much as they are woven into its fabric, Drogseth says.

De facto standards such as Java, HTML and XML help provide a cooperative interface between different vendors' products.

But true interoperability demands a common thread, "a standard structure of data maintained in the object store" — a database of network devices, applications and relationships, Drogseth says.

"At its most esoteric, standards refers to that platonically perfect state that never gets achieved," he says. "What we're seeing is some adoptino of some standards by some vendors."

Users should look for vendor partnerships to ease root cause tool deployment and management, he says.

That's easier now than several years ago, when one New York-based financial services firm began doing root-cause analysis. "We had to build a lot of things ourselves because they weren't available at the time," says the firm's IT vice president, Gary Butler.

"We're using the [System Management ARTS Inc.] correlation engine, and we're feeding it witb data from Tibco's smart agents" and San Francisco-based Micromuse Inc.'s NetCool presentation software, says Butler. "We can't always find the root cause 100% of the time, but we can at least find the more serious event, and that keeps us from wasting time with all the symptoms."

Revak says, "As the industry matures, the best bet is for companies to focus on developing their event infrastructure technology — a prerequisite for any advanced management — their people and their processes. Technology is not the most important. [Vendors] dislike it when I say this, but most important are the people and the processes" and the relationship between them.

Who's Using It

Of 135 companies surveyed by Enterprise Management Associates, 60% are doing event correlation.

Those Of companies use it to:

▸ Speed problem resolution	33%
▸ Improve service delivery	27%
▸ Reduce staff, overhead	24%

They're spending:

▸ More than $200,000	27%
▸ $100,000 to $200,000	16%
▸ $10,000 to $100,000	44%

They consider acceptable a rate of:

▸ 75% to 90% accuracy	43%
▸ More than 90% accuracy	40%

But how satisfied are they?

▸ Very	46%
▸ Somewhat	36%

SOURCE: ENTERPRISE MANAGEMENT ASSOCIATES INC., BOULDER, COLO.

GLOSSARY

- **Advanced correlative intelligence:** A problem-isolation method cloaked in secrecy by most root-cause analysis tool vendors. This is where language is most likely to become obscure or insubstantial.
- **Event correlation:** Examines the relationship among events across an IT infrastructure to narrow the search for the cause of a problem.
- **Object data store:** Knowledge specific to devices, applications and connections that provides a database of codified detail for understanding objects and their relationships. An extensive object data store can contain object performance data for use in modeling routine interactions across device types such as servers and routers.
- **Polling and instrumentation:** Provide ongoing event data about infrastructure availability, performance and topology. They can include common availability metrics, as well as CPU utilization or even remote monitoring.
- **Presentation and context:** Encompass issues around what you see, how it looks and what it tells you. No matter how detailed the reporting, unless it's presented in a way that suggests a solution, it's just so much noise.
- **Root cause analysis:** Isolates the cause of failure or poor performance.
- **Topology:** The map of where things are. It can detail both the physical (Layer 2) and logical (Layer 3) network, and move on up the Open Systems Interconnection stack to include configuration information relevant to systems and applications.

One-third of large corporations already have streaming media applications in place, but creating and delivering that streaming content takes some work, say IT managers. By Matt Hamblen

Streaming Media GOES MAINSTREAM

MANY COMPANIES have deployed streaming media for at least a few applications, but The Boeing Co. in Seattle thrives on it. At Boeing, it's possible to see Web-based video of rocket launches or to hear streaming Web audio of quarterly reports. And many of the aerospace company's 198,000 workers worldwide also have access to video, audio and slide presentation training materials over Boeing's internal network.

Boeing has made streaming media part of its IT architecture, say company officials. "With streaming, it's easier to express human emotion and make things easy to explain," says Dave Weitz, a senior communications manager.

The use of streaming media for corporate applications is taking off. About one-third of the 1,000 largest companies in the U.S. are using streaming Web-based media significantly, and half of them will be by 2003, says Lou Latham, an analyst at Gartner Inc. in Stamford, Conn.

"It's not complex, and it's not expensive" to provide streaming media to either internal users or external customers or partners, Latham says. But if a company sets up streaming feeds improperly, especially to fussy consumers on a Web site, it can become "an annoyance . . . and it will turn users off the whole process, and they won't use it anymore," he says.

IT managers face several challenges in creating and implementing streaming media. These include deciding what to outsource, knowing how to create content that's optimized for streaming, making sure internal streaming doesn't overwhelm network capacity and setting end-user expectations for streaming media quality.

Basic technology components for streaming media include video/audio servers to compress and encode digital images for streaming and a delivery network with sufficient bandwidth to accommodate the stream without interruption. End users also need to have PCs equipped with audio and video player software. Both RealPlayer Plus from market leader RealNetworks Inc. in Seattle and Windows Media Player from Microsoft Corp. are freely available.

Boeing has three years' experience with streaming audio and video and has discovered that for external Internet users, it's faster, "easier and far cheaper" to hire a content delivery network provider, says Weitz.

Such services typically cost $5,000 to $10,000 per event, analysts say, depending on the audience size, although several users say they pay a fraction of that amount if they use the service regularly.

"The majority of enterprises have hosted Web content themselves in the past when it was text and HTML, but when you start talking about a site with a lot of streaming media, you see a lot more outsourcing," says Michael Galleli, a consultant at KPMG Consulting in Los Angeles.

Boeing uses server software from RealNetworks to stream programs to internal and external users via the Web. Each user must have RealPlayer software to view and hear the programs.

Video and audio streaming have gained steam in the past two years as internal networks have increased bandwidth and as Internet access through high-speed cable modem and Digital Subscriber Line connections has become more common, analysts say. However, these technologies aren't as fast as advertised, Latham says, and companies must stream content to accommodate different connection speeds.

For outside users, Boeing encodes streams to be received by users with connections of 28K bit/sec., 56K bit/sec. or 200K bit/sec.

Latham argues — though some disagree — that 100K bit/sec is the slowest video stream to have acceptable quality. Users coming in over slower dial-up Internet connections are likely to experience jerky video and audio synchronization problems.

Charles Schwab & Co. in San Francisco produced its first live video webcast for active traders around the world in February and opted to use the content delivery services of Akamai Technologies Inc. in Cambridge, Mass., which piped Schwab data to video servers around the world, says Tracy Behler, director of e-communications media at Schwab.

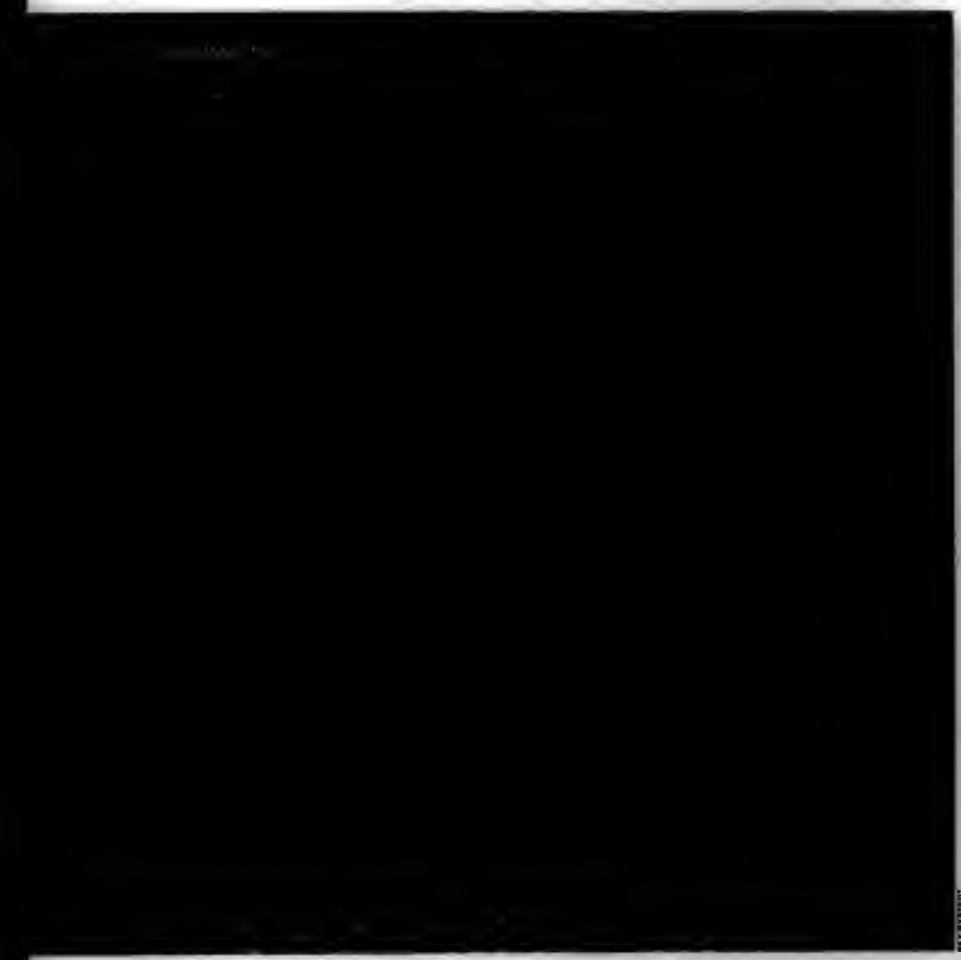
"We figured we're not the streaming experts," Behler says, noting that it took plenty of hard work by Schwab staffers to produce a good webcast. "The biggest thing we learned is it . . . takes an army to produce a quality program, with setting up the crew, picking the set and developing the right content."

UBS Warburg has been streaming video and audio from its morning analyst briefings since 1998 and recently began serving institutional investment managers in the U.S., says Imdad Hussain, head of technology for equities electronic marketing at the London-based firm.

UBS records the sessions with an automatic video camera, but London-based Raw Communications provides the servers that stream media over a satellite network provided by Loral CyberStar in Rockville, Md. "We could have done part of this ourselves, but we're an investment bank and not a streaming video provider," Hussain says.

Overall, outsourcing streaming is easier and cheaper, according to David Rader, an analyst at Jupiter Media Metrix Inc. in New York, who points out that once the content is created, there is a per-event cost and little else.

By contrast, costs for in-house efforts can reach $50,000 for a basic setup that includes a streaming



server, a live encoder and a camera, Rader says.

For companies streaming over internal networks, bandwidth is another concern. To support streaming to internal desktops, Boeing uses a single RealSystem server, Weitz says. Because simultaneous usage by 198,000 workers would clog its networks though, the company doesn't make live Internet-streamed video announcements available internally.

Instead, Boeing records such events and stores them on a server for on-demand use later. Mindful of the bandwidth limitations of its 10G bit/sec. 10Base-T LAN and T3 WAN connections, Boeing has restricted the system to 400 concurrent sessions. That seems to work out without network downtime because workers want to see announcements at different times, Weitz says. Workers still want to see live material though, so the company is in the midst of upgrading to a multicasting system where multiple distributed servers will stream content simultaneously and with greater bandwidth efficiency.

Boeing also faces another, more basic, obstacle to providing streaming media to internal users: The company has many older PCs that don't have sound cards or speakers, especially on the factory floor.

Aside from the basics of setting up a streaming infrastructure, IT managers must face the fact that Web video quality, while acceptable, is inferior to television-based video, Weitz says. And even if the Web video is high quality and the picture isn't jerky, it's still difficult to perceive cuts and fades in video shots as they would appear on television. This means you can't effectively put a TV commercial on a Web stream, he says.

Boeing usually provides internal users a streaming video window that's about 3 by 5 in., or one-fourth the full monitor size, but full-screen video is possible. Internal users receive streams at 200K bit/sec., which provides a good quality stream, Weitz says.

Still, he says, "We have learned that people have a hard time with quality and they expect the same quality of TV, which of course they don't get." And, he adds, "More employees and outsiders are expecting our streaming content — and the more that people hear of it, the more they demand it."

Tips for Better Streaming

1. **Consider hiring** a content delivery network service provider for **streaming to external users,** especially if you're providing **live streams.**

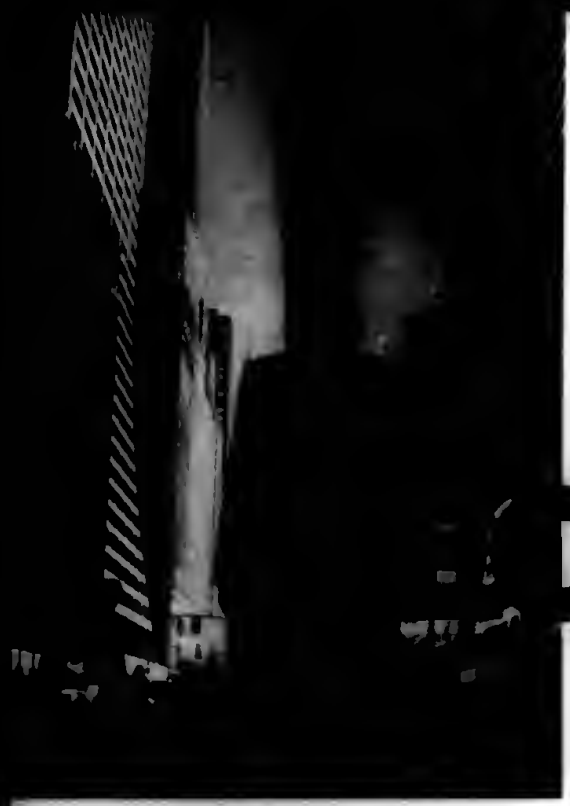
2. **Don't underestimate** the work and time involved in **scripting, editing and producing video** for streaming.

3. Design streaming media to **accommodate users** with low (28.8K bit/sec.) bandwidth.

4. For **internal streaming,** ensure that routers are **set to support** streaming functions and that the routers give streaming media **priority.**

5. Set up a **dedicated server,** either Windows 2000 or a RealNetworks server, for streaming **video and audio content.**

6. **Set user expectations** that streaming video will be of **significantly lower quality** than a standard video viewed on a television.



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Cascading Style Sheets

DEFINITION

Cascading Style Sheets (CSS) is a simple mechanism that allows authors to attach formatting information (such as fonts, colors, positioning and spacing) to HTML documents. The CSS language is human-readable and -writable and expresses style in common desktop publishing terminology.

BY JOY-LYN BLAKE

CASCADING STYLE Sheets (CSS) will definitely change the way you think about the Web.

With this technology, you can create reusable code that acts as a style sheet to define typographic and color information, position objects and control or change the look of an entire Web site, all from a single file. Style sheets let you control how a Web page is rendered without compromising its structure. You can do that to some extent with the Web protocol HTML, but CSS allows for pixel-precise positioning of elements within a page.

We've gotten used to the premise that page structure — including paragraphs, lists, tables and frames — is dependent upon coding practices. The more intricate the page structure, the more complex the coding required. Many Web pages have become little more than deeply nested layers of tables, font tags and line breaks — a nightmare to troubleshoot, rearrange or redesign.

Style sheets let Web authors accomplish the same result without all that messy HTML coding. Anyone who's ever had to troubleshoot HTML code knows how difficult it can be to track down errors.

Imagine the HTML tagging necessary to create a Level 1 header (H1) that sets the font of a passage of text and also calls for the text to be dark red, italic and underlined on a blue background, with a repeating horizontal image and a border around all. And you want a margin only at the top of the bar, not the bottom. HTML requires a table to accomplish this, along with the requisite tags controlling font color, font face and underlining. But the cell-padding parameters apply equally to the top and bottom of the cell, so there go your margin specifications.

CSS provides an alternative to messy HTML tagging.

CSS, however, gives you full control, without multiple tags or the need to wrap the entire element in a table. Here's the CSS code for the above example: *H1 {color: maroon; font: italic 1em Times, serif; text-decoration: underline; background: blue url (titlebg.png) repeat-x; border: 1px solid red; margin-bottom: 0; padding: 5px;}.*

You decide you don't like the blue background after all, and with a few quick keystrokes, make it green or yellow or — you get the picture. Want to add the same style to the Level 2 headers on the page? Just change the line to *H1, H2*. Now picture how much typing your production person would do to accomplish the same task in HTML.

CSS was created by Hakon Wium Lie, the chief technology officer at Oslo-based Opera Software AS, and Bert Bos, a member of the technical staff at the World Wide Web Consortium in Washington.

Lie and Bos built CSS on the premise of cross-platform design, using simple codes that are precisely documented in public specifications.

Thanks to the technology they created, you no longer need unseemly hacks and improper HTML coding to achieve the desired effects. That's all controlled simply and efficiently within your style sheets. Need to redesign a Web site? No more painstaking page-by-page code changes; update your style sheets, and the changes replicate instantly across your Web site.

The flexibility of style sheets extends even further.

Since specifications can be saved as a document, different styles can be called by those pages that require them. Your home page might require one structure, while all other pages use a second format. You can have one style sheet called by the home page and a second style sheet called by all other pages. Or simply embed the CSS text on the home page and call the main style sheet everywhere else. It's easy to divide your site into different formats for different areas, without bogging down production.

Not Without Problems

The use of style sheets isn't the answer to all of your problems. There are still limitations, particularly in pre-CSS browser versions. The first browsers that attempted CSS support — Netscape Navigator 4.x and Microsoft Corp.'s Internet Explorer (IE) 3.x — were buggy, incomplete and contradictory. Many of those problems have been cleared up in IE 4.x and 5.x, the Netscape Gecko rendering engine and Opera 3.6. In fact, author Eric Meyer used Gecko along with IE 4.5 and 5.0 for the Macintosh to create figures for his book *Cascading Style Sheets* (O'Reilly & Associates, 2000).

CSS allows Web authors to return to using HTML for structural purposes, not for presentation. According to Meyer, that capability, along with the further benefits of improving accessibility and positioning documents for a switch to an XML-based world, make CSS a compelling technology. The benefits arguably outweigh the drawbacks, which will be eliminated with time.

CSS in Action

For a truly elegant implementation of CSS, check out the Web site of Bötterspaperfabrik Gmund GmbH & Co. (www.gmund.com), a specialty paper producer in Gmund am Tegernsee, Germany. Although the page source code seems daunting, the results of using style sheets are well worth the time and effort.

The Web site appears to be laid out as an image map, with many overlapping rectangles carefully arranged in a graphics program, each one carefully coded in HTML to link to its page. It could have been done that way, but then changing any single image in the collection would have required reworking the entire graphic. With CSS, however, swapping out any single image layer is quick and easy. Just change the entry in the style sheet, and you're done.

– *Joy-Lyn Blake*

GMUND'S SITE provides a good example of CSS use.

According to Web usability guru Jakob Nielsen, "CSS promotes site consistency and improved usability."

Blake is a freelance writer in Dover, N.H.

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Making Fast Work of Wireless Applications

IConverse's drag-and-drop tools speed the development of wireless applications

BY AMY HELEN JOHNSON

WHEN FIRST Call/Thomson Financial wanted to add mobile capabilities to its mix of LAN- and Web-based delivery systems, it started looking for application development software that was flexible and easy to use, says Tom Bell, product manager at the financial research arm of Toronto-based The Thomson Corp. Using software from iConverse, Thomson's systems integrator needed only eight weeks to implement the system. That made Boston-based First Call/Thomson Financial one of the first in its industry to offer wireless access, says Bell.

That implementation speed is due to a visual drag-and-drop interface that sets iConverse apart from its competitors, says Andy Fox, chairman and co-founder of the Waltham, Mass.-based company. "We have the richest development environment anywhere, bar none," he says.

Drag and Drop

The interface lets developers visualize applications by dragging enterprise data onto their screens and then seeing how the results will appear for different types of wireless devices. A developer can customize the resulting screens and use the iConverse parallel publishing tools to automatically build an application for each wireless device targeted.

"You can quickly make applications for those devices that look good and are specific for each individual device," says Peter Firstbrook, an analyst at Meta Group Inc. in Stamford, Conn. And because the output is in Wireless Markup Language (WML), iConverse generates portable and customizable applications, he says. A developer can pour that WML code into a rapid application development environment like Visual Basic and then modify it.

The deployment piece, iConverse Interaction Server, maps presentation-neutral XML tags onto wireless devices like Wireless Application Protocol-enabled phones and personal digital assistants. XML enables iConverse to use data from many different sources.

Interaction Server runs on top of Java 2 Enterprise Edition (J2EE) application server. Because J2EE is a de facto industry standard, customers can choose an application server other than Interaction Server to run their wireless applications, Firstbrook says.

Cost Efficiencies

Fox says the biggest benefit IConverse gives developers is reduced creation and maintenance costs. He claims that the drag-and-drop graphical user interface (GUI) is so easy to use that a sophisticated end user can create the display for an application. However, a developer is still the best person to build the integration between back-end data sources and the wireless displays, says Fox.

In addition, companies can expand their applications with little added cost because the platform is licensed software instead of services, says Fox. IConverse also offers an application hosting service for customers who want to outsource their wireless deployment.

According to Fox, iConverse's ideal customer is an IT department in a large, global company that's building employee-focused applications for its mobile workers. The vendor is targeting industries such as field service, sales force automation and financial services.

Version 2.0 of the iConverse Mobile Studio and Interaction Server, which shipped last month, includes support for pagers and paging networks. Developers will find a better debugging utility, improvements to the interface, the ability to create and reuse objects, and easier back-end connectivity, says Fox.

The company plans to enhance the software's connectivity so wireless users can access data even if they aren't connected to their wireless networks. This means building data synchronization, says Fox. IConverse is also investigating support for natural-language speech technology, he says. ●

Johnson is a Computerworld contributing writer in Seattle.

ICONVERSE'S CO-FOUNDERS (from left): Toffee Albina, Andy Fox, Michael Tinglof and Tim Rochford.

iConverse

71 Second Ave., Waltham, Mass. 02451; (781) 622-5050

Web: *www.iconverse.com*

The technology: Wireless application development software

Why it's worth watching: Its drag-and-drop GUI is intended to speed development.

Company officers:
- Andy Fox, co-founder and chairman
- Ron Matros, CEO and president
- Toffee Albina, co-founder and chief speech technologist
- Tim Rochford, co-founder and chief technology officer
- Michael Tinglof, co-founder and vice president of research and development

Milestones:
- December 1999: Company founded
- December 2000: First version released
- April 2001: Version 2.0 released

Employees: 100

Burn money: $16.1 million from Advanced Technology Ventures and Prism Venture Partners

Products/pricing: IConverse Mobile Studio is available for free. iConverse Interaction Server starts at $100,000.

Customers: Massachusetts Electronic Commerce Association Inc., Salesnet, Smartshop.com Inc., Thomson Corp.

Red flags for IT:
- Development tools are less of a concern if you plan to outsource development and application hosting.
- Larger players like IBM and Microsoft Corp. could develop competitive offerings.

COMPUTERWORLD emerging companies

[the buzz] STATE OF THE MARKET

Waiting for Goliath

IConverse's competition is split between wireless service providers and similar development software companies, says Peter Firstbrook, an analyst at Meta Group. Wireless service providers such as Aether Systems Inc. in Owings Mills, Md., and Everypath Inc. in San Jose do the coding for their customers, so a good developer's interface like the one made by iConverse isn't a selling point. The other set of competitors, including companies like MobileQ and ThinAir Apps, provide comparable capabilities, he says, but neither has a rapid application development interface that's as good as the one iConverse has.

Firstbrook says the biggest threats to iConverse have yet to emerge. Eventually, the company will face competition from giant infrastructure providers like IBM and Microsoft Corp. These companies don't yet have mature wireless developer systems, he says, but they pose a significant threat because of their market reach.

If Microsoft were to provide a GUI in Visual Basic that matched iConverse's, it could grab market share because of its installed base and industry stature, Firstbrook says. "Even if it's technically not as good, people will go after it because [Microsoft] is a more strategic partner than iConverse," he says.

MobileQ Inc.

New York
www.mobileq.com

XMLEdge functions as both a development platform and a server for integrating business applications with mobile devices. The GUI-based development environment allows programmers to abstractly design the workflow and connectivity requirements for their applications.

ThinAirApps Inc.

New York
www.thinairapps.com

The ThinAir Server is a Java-based bridge between enterprise applications and laptops with wireless modems, Microsoft's Pocket PC, or wireless devices that use the Palm OS or Waterloo, Ontario-based Research in Motion's operating system.

– Amy Helen Johnson

The Top Certifications

To give yourself the best job edge and pay boost, consider training that will get you these certifications. By Mary Brandel

WHICH CERTIFICATION is right for you? The answer really depends on the stage of your career, the certifications you already have and your chosen technology area.

However, at any given time, there are usually some hot-button certifications that — because of supply, demand or the difficulty of achieving them — can substantially improve your salary or career prospects.

For example, just a few years ago, the Microsoft Certified Software Engineer (MCSE) certification promised large salary jumps for IT professionals who could boast of having one. While it's still the most popular certification and still in demand, so many people have the MCSE certification (almost 400,000 engineers in the U.S.) that it's become more of an entry-level requirement.

We asked IT recruiters and certification experts for their views on what will give you the most bang for your buck in the next year or two. We look at the top two here, with more certifications reviewed on *Computerworld*'s Web site. Most of these are top-end certifications that require a few years of job experience in addition to training.

Because they're more difficult to obtain, these certifications can increase your salary by 20% to 30%, according to Mike Kovatsh, an expert on training and certification at Edina, Minn.-based Techies.com Inc.

NETWORKING

▸Cisco Certified Internetworking Expert (CCIE)

Summary: Introduced in 1993, the CCIE helps identify internetworking experts. There are five areas in which a person can be certified: routing and switching, wide-area network switching, ISP Dial, SNA/IP, and integration and design.

Requirements: You must take a two-hour computer-based qualification exam and a two-day, hands-on lab exam at a Cisco Systems Inc. facility. The lab exam requires a deep understanding of Cisco equipment and general networking. Training alone is insufficient, but it can help, and there's a suggested list of Cisco courses to take. There are only two test lab sites, in San Jose and in Research Triangle Park, N.C.

How long it takes to obtain: It could take four or five years just to obtain the necessary experience to pass the CCIE exam. Assuming you're working full time, you might take a year or two to study for and take the written test and then study for, take and pass the lab exam. "It's pretty typical for half the candidates who take the lab exam to fail on their first try," says Ed Tittel, vice president of IT certifications at iLearning Inc., a training and education provider in Baltimore.

Supply vs. demand: CCIEs are "few and far between," says Ben Sabrin, a senior search consultant at New York-based recruitment firm Pencom Systems Inc. According to Cisco, there are fewer than 3,000 of these certified professionals in North America. They're especially in demand in the optical and networking space, such as at telecommunications firms.

Average cost: The lab test costs $1,250, and the exam fee is $300. Training ranges from $1,420 if you self-study to $4,100 to $6,300 if you study in a classroom, according to Tittel.

Career benefit: Having the CCIE designates you as part of an elite corps of internetworking professionals; it's one of the premier IT certifications.

Salary benefit: CCIEs can expect a 10% to 20% boost in salary, says Sabrin. And according to a survey last fall by *TCPmag.com*, CCIE certificate holders earn an average base income of $115,400 — a $45,500 jump (an almost 40% increase) over Cisco Certified Network Architects, another certification. They also reported larger bonuses, more stock options, more paid training and higher job satisfaction than holders of other Cisco certifications.

SOFTWARE DEVELOPMENT

▸Senior Java Certification

Summary: Certification programs include Certified Programmer for the Java Platform, Certified Developer for the Java Platform and Certified Enterprise Architect for Java 2 Platform, Enterprise Edition Technology.

MOREONLINE
For more information about useful certifications, visit our Web site. www.computerworld.com/cert

Requirements: The programmer track requires one exam; the developer track requires one exam and one assignment, plus previous Programmer certification; and the architect track requires a multiple choice exam, an essay exam and one assignment. Certifications can be obtained from Sun Microsystems Inc., Hewlett-Packard Co., BEA Systems Inc., IBM, Sybase Inc., Netscape Communications Corp., Novell Inc. or Oracle Corp.

How long it takes to obtain: You should have about two years of experience before taking the exam. If you have a full-time job, it could take six months to a year to obtain the certification.

Supply vs. demand: According to Tittel, there are six to seven job openings for each Java-certified individual.

Average cost: Exam and assignment costs from Sun range from $150 for programmers to $400 for developers and $550 for architects. Training ranges from $300 to $1,000 for self-study and as much as $3,500 for classroom-based study, according to Tittel.

Career benefit: "Getting certified helps prove you were able to take your background in C++ and marry that over to Java," Sabrin says.

Salary benefit: "You're looking at a six-figure salary, guaranteed," says Tittel. "I've heard of individuals doubling their compensation as a result of obtaining mid- or upper-level Java certifications, as compared to their precertification incomes." ◗

Brandel is a freelance writer in Newton, Mass.

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12:00 - 5:00pm
GOLF TOURNAMENT FOR PRE-REGISTERED ATTENDEES

7:00 - 8:30pm
PRE-CONFERENCE EVENING NETWORKING RECEPTION

MONDAY, MAY 21

7:00am - 8:00am
BUFFET BREAKFAST

8:00am

WELCOME & OPENING REMARKS
Alan Guibord, CEO, Computerworld
Maryfran Johnson, Editor-in-Chief, Computerworld

8:15am

OPENING KEYNOTE: GOING DIGITAL THE OLD-FASHIONED WAY: GM'S LEVEL-HEADED APPROACH TO E-BUSINESS
Ralph Szygenda, CIO, General Motors

9:00am
PANEL 1:
IT'S MISSION IMPOSSIBLE: GLOBALIZATION AND E-BUSINESS
Panel Moderator: Sarwar Kashmiri, CEO, ElsiChronicles.com

Ready or not, the Web is making the globalization of business a reality. But pursuing a global strategy means more for IT than creating a worldwide network infrastructure, setting up foreign distribution or hiring IT talent abroad. So how does an IT Leader go about getting a grip on strategy to support the enterprise's global business objectives? Our panel will share its collective international experience to send you off with a host of good ideas along with an action-item list.

10:00am
BREAK

10:15am

OLD RULES, NEW GAME: BUILDING PRUDENTIAL'S GLOBAL E-STRATEGY
Irene Dec, VP International Investments, Prudential Insurance

11:00am
PANEL 2:
THE NEXT WAVE OF E-COMMERCE: CONNECTING YOUR CUSTOMER CHANNELS
Panel moderator: Kevin Fogarty, Business & Technology Editor, Computerworld

The customer economy has arrived with a vengeance, trailing massive numbers of Customer Relationship Management (CRM) systems in its wake. But integrating disparate CRM applications and re-architecting workflow to get that mythical 360-degree view of the customer remains a major hurdle for IT. Are you tying all of your customer channels together — to realize — to leverage existing investments in front-office and legacy applications? This panel will bring together diverse industry views on a topic that ultimately affects every company's bottom line.

12:00pm
INTERACTIVE LUNCH: RECRUITING & RETAINING TOP TALENT

1:30pm

AFTERNOON KEYNOTE: SURVIVING THE REVOLUTION AND THRIVING IN THE CUSTOMER ECONOMY
Patricia Seybold, CEO, Patricia Seybold Group and Author of "Customers.com" and "The Customer Revolution"

2:15pm
PANEL 3:
WIRELESS WARRIORS AND THE CHALLENGE OF M-COMMERCE
Panel moderator: Bob Brewin, Senior Editor, Wireless Technology, Computerworld

Few technologies hold as much promise — or pose as many perils — as wireless networks and mobile computing. What are the best practices in deploying mobile commerce applications that resolve security concerns and location-service controversies? Which applications make the most sense for wireless LANs? How do you choose an architecture that works well for your user base? How solid is the Wireless Application Protocol (WAP) standard for unifying handheld devices and wireless networks? Our panelists will examine these core questions through the lens of their own experience, coming up with some practical recommendations for the next wave of wireless warriors.

3:00pm
BREAK

3:10pm

CLOSING KEYNOTE: THE ABILITY TO RISK INNOVATIONS
Chet Huber, President, OnStar

3:55pm
CLOSING REMARKS

4:00pm - 5:30pm
SPONSOR BREAKOUT SESSIONS

5:30pm - 8:30pm
COCKTAIL/NETWORKING RECEPTION
EXPO & BUFFET DINNER

TUESDAY, MAY 22

7:00am - 8:00am
BUFFET BREAKFAST

8:00am
OPENING REMARKS
Alan Guibord & Maryfran Johnson

8:15am

OPENING KEYNOTE: IT LEADERSHIP IN A CHANGING ECONOMY
Doug Busch, CIO, Intel

9:00am
PANEL 4:
THE HEAVY HAND OF UNCLE SAM IN ONLINE SECURITY AND PRIVACY PROTECTION
Panel Moderator: Alan Paller, Research Director, SANS Institute

Wherever technology touches its citizens there days, the U.S. government seems to be there with new regulations or proposed legislation. The high-tech sector remains split about how to approach online privacy guarantees to the U.S., while the European Union has already adopted tough data protection laws that multinational companies must follow. Our expert panel will talk about strategies for keeping a step ahead of Uncle Sam in this uncertain, potentially explosive, regulatory environment.

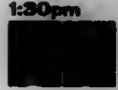
10:00am
BREAK

10:15am

PRIVACY - IT'S NOT JUST A COMPLIANCE ISSUE
Eddie Schwartz, VP of Strategy, Guardent (former Chief Security Officer, Nationwide)

11:00am
TOWN HALL MEETING: "ASK THE CAREER EXPERTS"
Maryfran Johnson

12:00pm
EXPO & BUFFET LUNCHEON

1:30pm

AFTERNOON KEYNOTE: THE BEST OF BOTH WORLDS: THE SYNERGY BETWEEN OPERATIONS AND IT
Laura Ollie and Margo Connelly, Co-CIOs, Capital One Financial

2:15pm
PANEL 5:
THE NEW ROI: TRACKING TECHNOLOGY PAYBACK IN A TOUGH ECONOMY
Panel Moderator: Julia King, Executive Editor, ComputerworldROI

Now is the time to recession-proof your IT organization, generate some new ideas and find new revenue streams. How is your company using the Internet to streamline processes within the organization and deal more effectively with your supply chain? Are you creating online relationships with partners and competitors alike? Where can you use IT to create new products and services? Getting focused on the and business opportunities and the ROI behind technology expenditures is the mission of this panel.

3:15pm
BREAK

3:25pm

CLOSING KEYNOTE: ESSENTIAL INGREDIENTS FOR B2B MARKETPLACE LIQUIDITY
Harvey Seegers, President/CEO, GE Global eXchange Services

3:55pm
CLOSING REMARKS
Alan Guibord & Maryfran Johnson

4:00 - 5:30pm
SPONSORED BREAKOUT SESSIONS

7:00pm
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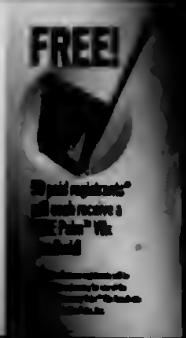

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IT Careers in E-Business

When strong businesses look to the Internet as a new channel for sales and distribution, the results tend to add strength. For some e-retailers, the foundation for the business was set early in the evolution of online sales. The result for these companies tends to be an operation that is succeeding as a business and that is breaking down walls in terms of creating new technologies and systems.

Enzo Micali, chief technology officer, says **1-800-Flowers.com** is a multi-channel retailer that went public in 1999. Analysts are estimating that revenues will run between $440 and $450 million in the fiscal year ending in June. Yet this is no upstart. **1-800-Flowers.com** was a pioneer in e-retailing, launching its first sales proposition in 1992 via CompuServe. "We were the first merchant on America On Line in 1994 and established our own website in 1995," Micali says.

As a pioneer in technology, **1-800-Flowers.com** continues the push, now moving into the wireless environment. The company also recently brought in-house its web development operations and continues to enhance the capabilities for business operations and users. "We have as long and as rich an e-commerce history as anyone in the business, so this is a natural evolution for us," explains Micali.

1-800-Flowers.com continuously searches for IT talent. "We look for big company experience," Micali says. "We are no longer a small company, and as we move/grow toward $1 billion in revenues, we are looking for people who have performed in this type of environment. We also need people who have managed or established processes and structure. The third thing we look for on resumes is potential – not just what someone has done so far, but how much farther they can grow."

The employment proposition at **1-800-Flowers.com** continues to develop. "We are an e-commerce pioneer, which means with this company you will be part of a history of developing, testing and implementing technology," Micali says. "Because we're growing, there's potential for you – in terms of what you will learn and where your career can go. Finally, we're proven – we've been around and have a business model that will hold for the long run."

careers

For more job opportunities with e-business firms, turn to the pages of ITcareers.

- **If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.**
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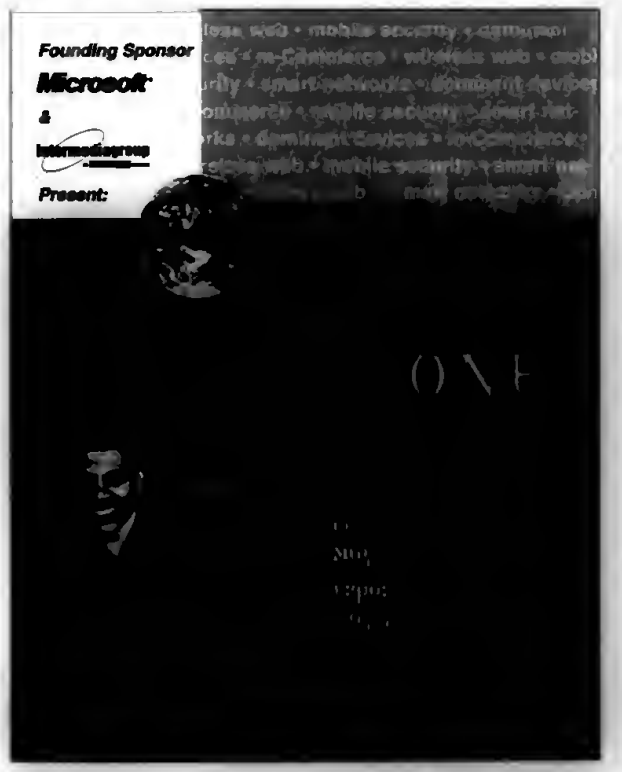

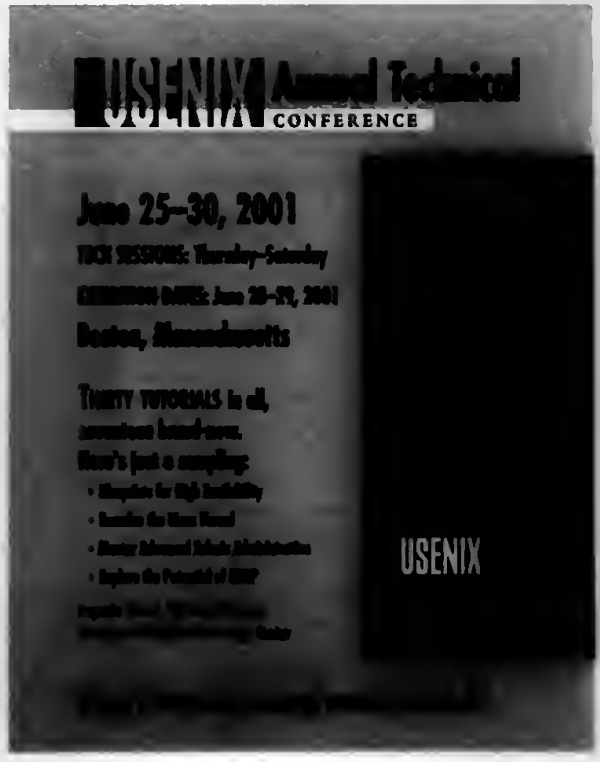

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Software Engineer Designs and develops mechanical load cells for determining weight accuracy of packages and other postage related items and insures integration of such mechanical load cells with various electronic hardware design. Develops appropriate hardware codes for proper scale functioning including design and development of control systems for load cell testing and quality control assurance. Modifies electrical and electronic scales for use in various international settings. Designs, develops, implements, and modifies a remote access software system which is capable of accessing and receiving postal rate change information functions for use in various postal scales to insure processing payment of postage rates. Requires Master's degree in Electrical Engineering, Software Engineering, or Computer Integrated Manufacturing System. Also requires two years experience in the job to be performed. Hours: 8:00 a.m.-5:00p.m. 40 hours per week at $65,000.00 per year salary. Job Location: Wheeling, Illinois. Applicants must show proof of legal authority to work in the U.S. Please send two copies of resume and cover letter to Illinois Department of Employment Security, 401 S. State Street-7 North, Chicago, IL 60605. Attention: Joanne Breaux. Reference #V-IL 25858-N. AN EMPLOYER PAID AD. NO CALLS.

SYSTEMS PROGRAMMER (St. Louis, MO) -Needed for Info Tech Co.; BA Comp Sci. Math or equivalent & 2 yrs. exp.; Fax CV to S. Dent, HR @ (314) 994-0689

GAVS Information Services Pvt Ltd., a Denver-based consulting company seeks qualified individuals to fill the following positions: Project Manager Programmer Analyst, Senior Programmer Analyst, Software Engineer and Senior Software Engineer. The positions are located in Denver Colorado. Interested individuals should send their resumes to GAVS Information Services Pvt Ltd. 4155 E. Jewell Ave. Ste 603, Denver, CO 80222

Contant Inc provides IT strategy consulting, systems integration and software development to clients nationwide. We have immediate full-time opportunities for both entry level and experienced professional in any of the following areas:

SAP R/3
♦ Functional
(Financials, Logistics, HR)
♦ Technical
(BASIS, ABAP, ALE/EDI)

NETWORKING
♦ Network Engineers & Consultants
♦ Systems Engineers (MCSE)
♦ LAN/WAN Specialist (CISCO)

APPLICATION DEVELOPMENT
♦ Microsoft Certified Solution Developer
(Visual Basic, Visual C++)
♦ Database Administrators (Oracle, SQL Server)
♦ Web Based Development (Java or JavaScript, CORBA, Microsoft ASP, ActiveX, COM/DCOM)

Job opportunities are also available for Sale Managers, Marketing Managers, Business Managers, Human Resources Managers, Controllers and Technical Recruiters. Bachelor's or Master's degree required depending on position. We also accept the foreign education equivalent of the degree or the degree equivalent in education and experience. Excellent benefits. Send confidential resume and salary requirements to Contant Inc, 9 Neshaminy Interplex, Suite 209, Trevose, PA 19053. An equal opportunity employer

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Senior Software Engineer Job Location: Plano, Texas. Duties: Design, develop, troubleshoot and debug embedded software for real-time operating systems, compilers, routers, networks, utilities and databases using C/C++, Microsoft Visual C++, assembly for PowerPC and MIPS, shell scripting, and Tornado software development. Create design software system analysis, document for various projects. Design, analyze, implement, test and modify local, network or internet-related computer programs for commercial or end-user applications-hardware verification tools, desktop applications, firmware. Develop, apply and maintain quality standards and related protocols for software products. Design and create test plans and procedures and interfaces with software/hardware engineers regarding the results of the test. Requires Master of Science in Computer Science or related field, and 2 yrs. exp. in the job offered or 2 yrs. test as a Software Engineer. Experience which may have been obtained concurrently must include: 2 yrs. exp. working with C/C++, Visual C++, and vxWorks BSP. Send resumes (no calls) to: Matthew D. Brandalise, Integrated Device Technology, Inc., 2975 Stender Way, Santa Clara, California 95054

Vice President, Content Group. Job Location: Houston, Texas. Duties: Direct and coordinate activities of the Content Group in order to meet the profitability and growth objectives for the Content Factory operations. Formulate and administer company policies, and develop long range goals and objectives. Direct and coordinate department activities to meet goals and objectives. Review achievements and propose changes in goals or objectives. Supervise Manager of Content Development Analysts, Operation Analysts, and Administrative Assistant. Manage clients needs and potential for products, tools and interfaces. Assess partners for hosting solutions in emerging new markets. Develop partnership relations with third party companies to achieve scalability and market diversity. Requires Bachelor's or Foreign Equivalent in Management Information Systems or related field and 2 yr exp in job offered or related occupation which may have been obtained concurrently. EOE. Send resume (no calls) to Fernando Claudio, Vice-President of Human Resources, Procure Net, Inc., 2 Madison Rd., Fairfield, NJ 07004

Senior Consultant needed for computer software development and consulting firm. Job duties include analyzing, designing, developing and implementing computer software applications. Database administration in relational database systems using Oracle Developer/2000, SQL*DBA, SQL*Loader, SQL*Forms, PL/SQL, UNIX and Windows NT. Applicant must have MS in Computer Science, Mathematics, Engineering or Business. Applicant must have 2 years experience in the job duties listed above or 2 years experience in any computer related occupation. Experience must include 2 years of database administration in relational database systems using Oracle, PL/SQL, SQL*DBA, SQL*Loader, SQL* Forms and UNIX. Mon-Fri, 40 hours per week, 8:00 a.m.-5:00 p.m. $62,442.00/yr. Applicants must show proof of legal authority to work in the US. Send resumes in ILLINOIS DEPARTMENT of EMPLOYMENT SECURITY, 401 South State Street – 7 North, Chicago, IL 60605. Attention: Sheila Lindsey, Reference #V-IL 24700-L. An Employer Paid Ad. NO CALLS. SEND 2 COPIES OF BOTH RESUME AND COVER LETTER

Software Engineer sought by software consulting company in Englewood, CO. Design, develop, implement and maintain ORACLE software applications and relational database management systems. Engage in full life-cycle software development and/or administration of ORACLE-based enterprise resource planning (ERP) software applications. The applications run in a client/server environment or are web-based. Analyze requirements. Create designs and design documentation. Code, test and debug the software applications. Use shell scripting, programming language C, Pro*C, the full ORACLE tool set, HTML, and JAVA in the design and development process. Engage in project management as required. Requires Bachelor's or foreign equivalent in Comp. Science or related field. 2 yrs designing and developing ORACLE software applications. Working knowledge of ERP applications, shell scripting, Pro*C, and the ORACLE tool set. $90,000/yr. M-F, 8am-5pm. Respond by resume to James Shimada, CO Dept. of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. JL 1118515.

Network Analyst/Programmer sought in Rockford, IL. Responsible for LAN, WAN, HP3000 MPE & NT operating systems, Net Servers, T1 and communications devices. Ability to program for web development. Must be proficient in Cobol and Visual Basic. B.S. Degree in Computer Science and min 2 yrs exp. 40 Hrs/Wk, $36,000/Yr, M-F 9a.m.-5p.m. Some travel. Applicants must show proof of legal authority to work in the U.S. Respond to Illinois Department of Employment Security, 401 S. State St.–7 North, Chicago, IL 60605. Attn: Brenda Kelly. Ref #V-IL24212-K. An Employer Paid Ad. NO CALLS. SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Sr. Software Engineer. 2 pos. Denver, CO. Dsgn, dvlpmt, testing, integration, maintenance & customization of bus. s/ware applics. prgms. Implmt client's functional reqmts in dvlpg tech. applic. architecture & tuning of C/S applics. Dsgn functional specs for applic. prgms. Documentation of prgms, creation of test data, test scripts & execution of test scripts applying knowl of SAP, Lotus Notes, MO-Sense, Java, & DB/2 on multiple h/ware & s/ware platforms. MS Comp Sci (or foreign deg equiv) + 3 yrs exp or BS + 5 yrs exp. 40 hr/wk, $66,100/yr. Application by resume to CO Dept of Labor & Employment, Attn: Jim Shimada, Tower 2, Ste 400, 1515 Arapahoe St, Denver, CO 80202-2117, ref to JO# JL1118507

Software Engineer sought by software consulting company in Denver, CO to work in Los Angeles, CA & other unanticipated job sites in the US. Engage in full life-cycle software development in a client/server environment. The software applications run on UNIX & Windows operating systems, & incorporate ORACLE relational database management systems. Analyze requirements & create designs. Code, test, debug, & modify the software applications. Use Visual Basic, SQL/Server, SQL*Navigator debugging tool & Developer 2000 in developing the software applications. Train users of the software applications as necessary. Requires Bachelor's or foreign equivalent in Comp. Science or Eng. (excluding Elect. & Comm. Eng.). 2 yrs exp in full life-cycle software development in a client/server environment. $66,100/yr. M-F, 8am-5pm. (5 openings) Respond by resume to James Shimada, CO Dept. of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 & refer to Job Order No. JL 1118514

Software Engineer (2 positions) – Research, design and develop computer software systems in conjunction with hardware product development applying principles and techniques of computer science, engineering and mathematical analysis. Requires 4 years experience in the job offered or 4 years experience as Programmer/Analyst, Systems Engineer, Systems Analyst. Must have 1 year experience using PowerBuilder and Sybase. 5 day, 40 hr/wk, $67,500/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number JL1118520

Network Architect. Implement, perform, plan multi-protocol networks, consultation/proj. mgmt on Datacom LAN/WAN 10/100/1000 Ethernet TCP/IP SNA SNMP Unix. Req. MSEE or BS w/ 5 yrs exp. 40hr/wk. Job/Interview San Jose. Send resume Sprint eSolutions, Box 264443 S.J. CA 95159

IT Professionals

Entergy, one of America's largest utility companies, has multiple openings for the following occupations in multiple locations.

• Information Technology Professionals
• Systems Analysts
• Computer Programmers
• Software Engineers

For immediate consideration, please forward your resume and salary requirements to Entergy Corporation and operating subsidiaries. Attn: Ms. Lori Handler, HR Department, PO Box 61000, New Orleans, LA 70161. Phone: 504-576-4117. EOE/M/F/D/V. Principals only. You will only be contacted if you are considered for an interview.

Software Engineer (2 positions) – Research, design and develop computer software systems in conjunction with hardware product development applying principles and techniques of computer science, engineering and mathematical analysis. Requires Master or equivalent in Computer Science, Engineering or Mathematics. Equivalent is Bachelors plus 5 yrs exp. Requires 3 yrs. test if Masters or 5 yrs exp if Bachelors in the job offered or as Systems Engineer, Programmer Analyst or Systems Analyst. Must have 1 yr exp using Oracle. 5 day, 40 hr/wk, $65,000/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number JL1118353

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IT careers

SOFTWARE ENGINEER to design develop implement test maintain and support web-based application software in a client/server environment using C C++ VC++ Java MFC COM ATL COM HTML MTS SQL Server Oracle Visual Basic and IMAN Script on UNIX and Windows platforms. Require M.S. degree in Computer Science an Engineering discipline or a closely related field with two years of experience in the job offered or as a Programmer/Analyst. Extensive travel on assignments to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to Ravi Kandimalla, President, Everest Computers Inc. 900 Old Roswell Lakes Parkway Suite 300 Roswell GA 30076 Attn: Job AJ

Pr/Analyst I(Oakbrook, IL) Study user req'ments document & syst specifications. Design progr logic, code compile walk thru unit test progr & JCL. Prep test data & test coded progr. Asst in develop/ment of s/ware user manuals. Asst in transfer of source code to production status. Resolve customer complaints w/s/ware. Maintain production s/ware by making fixes & tests. 40 hrs/wk. Sa 5p. $59,000/yr. BS in Comp Sci/Eng/Math & 1.5 yr exp in job or S/ware Eng. Exp must incl CICS, Cobol, DB2, SQL/DS, OMF, SPUFI, TSO/ISPF, Vsam, JCL, VMS/XA, DOS/VSE. Applcts must show proof of legal authority to work in US. Res to IL Dept of Empl Security, 401 South State St, 7 North, Chicago, IL 60605. Attn: S. Lindsey. Ref # V-IL 24986-L. An employer paid ad. NO CALLS – Send 2 copies of both res & cvr ltr

SENIOR SYSTEMS ANALYST
Lead Peoplesoft Financial and Distribution Projects using Peoplesoft Financial Modules such as GL, AM, AR, AP and Peoplesoft Distribution modules such as OM, INV, BI and PO by using PeopleTools Technology, SQR, Peoplecode, Crystal Reports, nVision, Oracle RDBMS and other implementation related analysis tools. BS Comp Sc /Rel Field and total of 2 yrs exp with at least 1yr exp in lead role using tools above. $80,000/yr and benefits. Respond in person or mail to North Metro Job Order # 6973106 GA: 2943 N. Druid Hills Rd, Atlanta, GA 30329 to the nearest Department of Labor Field Service Office.

Systems Analyst Duties: Develop web-based Java system to collect financial results from dealers storing data in mainframe DB2 tables to facilitate the creation of multiple reports by mkt. segment. Develop, maintain & enhance DB2 databases on an AIX platform which are involved in the prod. & testing of semiconductors & microchips. Resp for SAS to COBOL conversions, program & system changes incl testing & qual. assurance. Requires: 2 yrs. of college & 6 mths. training in Application Development. EOE. 40 hrs./wk., 9:00 a.m. to 5:00 p.m. Salary $58,000/yr. Send resume (no calls) to: E. Fred Pierce CTG, Inc. 1233 Shelburne Rd., Ste 195, S. Burlington, VT 05403.

SENIOR BUSINESS ANALYST
Analyze, Design & Develop custom reports for OM, MM, SD, FICO & PP Modules, utilize SAP enhancement techniques like User exits, Menu exits, Program exits, Use BDC, call transaction, IDOCS, direct input and data extraction methods in above modules. Data mapping of Legacy to SAP using Mercator & MQ series Utilz. SAP scripts. Develop and test interfaces utilizing EDI. Configure and set up partner profiles using ALE and IDOCs to transfer master data. MS Comp Sc/Rel Field; MBA and 2 yrs. exp with at least 1yr exp. in tools above. $65,000/yr. and benefits. Respond in person or mail to North Metro Job Order # GA 6977260, 2943 N. Druid Hills Rd, Atlanta, GA 30329 or the nearest Department of Labor Field Service Office.

Software Engineer
Des dev and imp sophisticated web based applications. Plan and dev IT sys and multi-tier distributed computing s/w apps. Exp must inc proficiency in OOD, OOA & modern s/w methods for bldg sys arch & apps. Cands must be Sun Certified in Java & have exp with current techs: Java, JDK, J2EE, EJB, Servlets, JSP, Java Beans, JFC/Swing, JDBC, ODBC, CORBA, COM/DCOM. Must work in a team with multiple platforms inc Sun solaris & UNIX. Adv knowledge of RDBMS systems esp Oracle required. Resp inc app life cycle dev, imp and rollout. Ability to produce tech doc req. MS in CS or App. Math + min 3 years exp. Send 2 copies of resume to GRT Corp. Dept FG, 777 Summer St., Stamford, CT 06901. EOE/M/F/D/V

SOFTWARE ENGINEER
Software engineer to design, develop and test computer programs for business applications, analyze software requirements to determine feasibility of design, direct software system testing procedures using expertise in PowerBuilder, PFC, Sybase and Crystal Reports. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and five years experience as a software engineer or computer programmer knowledge of PowerBuilder, PFC, Sybase and Crystal Reports. Salary: $70,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Sue Notarodilla, Fayette County Team PA CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513. Job No. WEB169836

SENIOR SOFTWARE ENGINEER to design, develop, test, implement and support web-based application software systems in a client/server environment using Visual Basic, VB Script, Visual C++, Java, JScript, ASP and HTML under Windows 95/98/NT and UNIX operating systems, install, tune and administer web-based application and database servers at the data center. Train end users. Require: Master's degree in Business Administration, Management, Computer Science or a closely related field with two years of experience in the job offered or as a Systems Analyst. Extensive travel on assignments to various client sites within the U.S. is required. Competitive salary offered. Send resume to Murli N. Reddy, President, Charter Global Inc., 5445 Triangle Parkway, Suite 190, Norcross, GA 30092. Attn: Job PA.

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1-800-762-2977

PROGRAMMER/ANALYST to analyze, design, develop, test, implement, modify and maintain software for various business and financial applications in a client/server environment using Visual Basic, HTML, Java, Active Server Pages, MS SQL Server, MS Access and Oracle under Windows 95/98/NT, UNIX and DOS operating systems. Require Bachelor's degree in Computer Science, Management Information Systems, Business Administration or a closely related field with two years of experience in the job offered. Extensive travel on assignments to various client sites within the U.S. is required. Competitive salary offered. Send resume to Sam Mahalingam, Assistant Director, Protech LLC, 3905 Lake Lanier Drive, Duluth, GA 3097. Attn: Job RR

SOFTWARE ENGINEER to design, develop, implement, test, maintain and support web-based application software in a client/server environment using C, C++, Java, HTML, Oracle, CORBA, Perl and CGI on UNIX, SUN Solaris and Windows platforms. Require M.S. degree in Computer Science, an Engineering discipline, or a closely related with two years of experience in the job offered or an a Programmer/Analyst. Extensive travel on assignments to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to Ravi Kandimalla, President, Everest Computers Inc., 900 Old Roswell Lakes Parkway, Suite 300, Roswell, GA 30076. Attn: Job RA.

SOFTWARE ENGINEER to design, develop, implement, install and maintain SAP R/3 client/server based software systems, focusing on Material Management (MM) and Production Planning (PP) modules, using ABAP/4, SAP Web Studio and Oracle in a Windows environment. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered to as a Programmer/Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to Jawher Reddy, CDO, Business Information Systems, Inc., 3791 Presidential Pkwy., Suite 124, Atlanta, GA 30340. Attn: Job VC

RESPONSIBILITIES:
Clinical Programmer Analyst- For a pharmaceutical contract research organization, provide analysis, database development, documentation and maintenance, and apply statistical methods to provide information, provide assistance in the development of data reports, tables and summaries, assist in CRF development, provide randomization tables, design and develop statistical analysis plans, prepare, review, and present statistical report results, serve as internal and external contact for all issues related to statistical methodology and analysis. Req M.S. or equiv in Stat., Comp. Sci. to rel. field, 1 yr exp. in job offered to 1 yr exp. in conducting statistical anal. Exp. must incl. prog. w/SAS, SQL, Visual Basic & Access. Exp. can be gained while pursuing degree. Prof. in SAS, C, SQL, MS Access, Visual Basic, Excel, Word, UNIX & PC Windows. 40 hrs/wk. Send resumes to P.O. Box 366, Essington, PA 19029

Programmer Analyst (multiple openings) Plans develops tests, and documents computer programs. Converts project specifications, using flowcharts and diagrams, into sequence of detailed instructions and logical steps for coding into computer language. Analyzes reviews and alters program to increase operating efficiency or adapt to new requirements using Internet Applications and related software. Work requires extensive travel and frequent location. One year of experience in job offered or as a computer professional as well as one year of experience using 2 of A and 1 of B or 2 of A and 1 of C as follows: A= ASP, HTML, CGI, Perl, MTS (IIS 6), JAVA™ products. C) Cold Fusion, Broad-Vision, ATG Dynamo, Net Dynamics, WEBSphere, Front Page. Bachelors degree or equivalent in one of several limited fields: Computer Sci/Apps, Eng, Chem, Math, Physics or scientific related field. Salary: $67,000 per/yr, 40 hrs/wk, 9:00-5:00 p.m. Please submit resumes to: Ms. Barbara Cole, Supervisor, Greene County Team PA, CareerLink, 4 West High Street, Waynesburg, PA 15370-1324. Please Reference Job Order No. WEB 171113

ENGINEERING Consultant assess customers design processes and use of specific electronics design automation ("EDA") software tools, prepare project plans for improving customer's electronic product design processes, implement specific technical solutions for ASIC design, simulation, synthesis, and verification of ASIC backend processes & ASIC. Vendor tool utilization. $73,385.00/yr. 40 hrs./wk. No experience necessary. Req. M.S. or equiv. in Elec. Eng. ASIC design. Vt.St.C. Place of employment and interview: Waltham, MA. Applicant must have legal authority to permanently work in United States. Send this ad with (2) copies of your resume to: Case # 20002808, Labor Exchange Office, 19 Staniford St., 1st Floor, Boston, MA 02114

Software Engineers needed. Bellevue, WA based company has several senior and entry level positions available for qualified candidates possessing MS/BS or equivalent and/or relevant work experience. Work with some of the following: C++, JAVA, XML, Unix, Windows and Oracle. Must be willing to travel and relocate on required. Email or Fax resume to DataChannel, ATTN: Tresa Hoang at: tresah@datachannel.com. Fax: 6425-637-1192

Sr. Consultant/ Lotus Notes Duties: Design, develop & deploy webbased & software applications using Lotus Notes, Domino, Javascript & HTML. Define software arch & develop & document software components. Perform troubleshooting of system applications. Requires: M.S. in Comp. sc. Info. Sc., Eng. or related field & 3 yrs. exp. in the job offered or 3 yrs. exp. as a Consultant, Software Eng. or Eng. Will accept B.S. (or foreign equiv.) & 5 yrs. of prog. exp. in the comp. ind. in lieu of M.S. and 3 yrs. exp. Exp. which may have been obtained concurrently, must incl. 3 yrs. exp. designing and developing software applications using Lotus Notes, Domino. EOE. 40 hrs./wk., 8:00 a.m. to 5:00 p.m. Salary $96,000/yr. Send resume (no calls) to: Diane Tuccillo, Answer-Think, Inc., 817 W. Peachtree St. Ste 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

Engineering

Lead Engineer

Functions as a senior member of a team responsible for developing second-generation middleware solution for corporate information access needs while maintaining the corporation's existing information access solution. The existing infrastructure uses OO Design techniques using C++ on an HP UX platform and a variety of communications vehicles including Enterprise Access, MQ SERIES, Telepathix proprietary TOPCOM, TCP/IP and socket connections. The new solution will take advantage of state of the art technology including CORBA, Java, BEA's WebLogic Enterprises, TUXEDO and E-biz. The existing application is built using OO Design methodology and C++ on a HP UNIX platform and uses variety of UNIX IPCs. The application is thread safe, employing POSIX threading technique. This position provides architectural direction for the development team of 5 to 10 members and function as mentor and technical reference for the lesser-experienced members of the development team. Requires a M.S. in Computer Science or related field, plus working to theoretical knowledge of (a) CORBA, Java, OO Design, C++ on an HP UNIX platform, (b) OO Design techniques using C++ on an HP UX platform, (c) Enterprise Access, MQ SERIES, TOPCOM, TCP/IP and socket IPC Architecture for middleware solutions which are highly scalable, available, available fault tolerant and standard. Salary: $75,000/year, M-F 8 a.m. - 5 p.m. Reply by resume only to: Colorado Department of Labor & Employment, Employment Programs, Attn: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, Co 80202-2117 and refer to job order number JF1116564

DIRECTOR OF TECHNICAL SERVICES to direct and coordinate the organization's IT product and service activities and assist President and executive team in formulating and administering company goals, objectives, policies and procedures. Study and analyze business processes of client companies to recommend business process strategies for optimizing efficiency. Establish work plan and staffing need for business process re-engineering and software development projects and arrange for technical recruiting and assignment of project personnel. Confer with project personnel to provide technical advice and resolve problems, drawing technical background in business process re-engineering. Direct and coordinate resources of project personnel and equipment to ensure successful deployment while supporting sales and marketing organizations. Participate, guide and assist in development of project deployment and customization plans of WEB enabled client/server applications such as Oracle database to be integrated in a ERP/CRM environment interface with customer during the pre-and post-sale phases to ensure expectations are met on time and within budgets. Review analysis of activities, cost operations and forecast data using knowledge of finance and accounting principles to determine department's progress towards stated goals and objectives. Require: Master's degree in Business Administration, Management Information Systems, or a closely related field with two years of experience in the job offered or in managing IT projects related to the provision of technical services. Competitive salary offered. Send resume to: Murli N. Reddy, President, Charter Global Inc., 5445 Triangle Parkway, Suite 190, Norcross, GA 30092. Attn: Job SR

Multiple openings for permanent programmer analyst, system programmer quality assurance, test engineer database administrator, systems administrator networking, business analyst and software engineer positions from entry to senior level throughout the US. exp design, develop, program and test business applications, enterprise systems, networks and computer systems involving TPF, sales force automation, data warehousing, business metrics, E-commerce, Internet/Web applications, and others using object oriented design and development, relational database modeling, distributed systems, and current Web technologies. Particular tools include one or more of JAVA, C/C++, Visual Basic, ASP, ActiveX, UNIX, SQL, SAP Windows NT, Lotus Notes, Perl, COBOL, IMS, CICS, DB2, TPF, Assembler, COBRA, HP-UX, COM/DCOM, OLE, CGI, Internet protocols, and others. B.S. in Computer Science, Engineering, Math, or related area. Will accept combination of education, training and experience in lieu of degree. Prior experience and M.S. required for some positions. Competitive salary+401(k)+benefits offered. Most active locations include: Atlanta, GA; Bloomington, MN; Chicago, IL; Colorado Springs, CO; San Francisco, San Jose, CA; Durham, NC; Ft. Lauderdale, FL; Hunt Valley, MD; Madison, WI; Miami, FL; Minneapolis, MN; Minneapolis, MN; Richmond, VA; St. Louis, MO; Houston, TX; and Winston-Salem, NC. Send resume to: InfoMark, 20 Commerce Drive, Suite 300, Cranford, NJ 07016 Attn: Carol King.

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We know you're in demand. So demand the best environment for your growth. IT consulting with an international leader. We're everywhere business and industry are with offices all over the country. So you've always got a new set of challenges, with total support. We're currently recruiting the following professionals: Programmers, Programmer/Analysts, Application Development Specialists, Database Analysts, Business Analysts, Technical Support Specialists, Operations Specialists, Network Administrator Specialists, Software Engineers, and Lead Analysts/Programmers.

Find out more about the rewards of working with Ayton. To apply for positions in any of our district offices, please visit our website to www.ayton.com. If you're interested in relocation opportunities, don't hesitate to call 1-800-797-2342 or forward your resume to: Ayton Dept. CW1, 550 American Ave., Suite 301, King of Prussia, PA, 19406

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PROGRAMMER ANALYSTS required for our Hickory Hills office. Design, develop and maintain new and existing software applications for industry and business using Developer 2000/ Designer 2000, Visual Basic, Oracle Cobol C++, Erwin and object oriented design. Develop and implement client server applications in oracle financials and using synchronization techniques in Oracle tools such as PL/SQL Developer 2000 and designer 2000 write source codes based on design specifications, research feasibility of new products/features and add new features as requested by client request, perform unit system and integration testing before release and correct bugs. Develop relational database system in oracle Visual Basic and Windows Unix environment. Bachelors Degree required in Math, Computers, Engineering or any other related field of study plus two (2) yr of experience in the job described above. 40 hrs/wk. Must have proof of legal authority to work permanently in the U.S. Please send resume and cover letter to HR Manager, Compro Consulting Group, 8519 W. 95th St., Hickory Hills, IL 60457

A rapidly growing IT CO. located in Diamond Bar, CA, is looking for top-notch professional wrap in a combination of the following areas:

O/S: UNIX, AIX, HPUX, Solaris, Win 9x/NT

RDBMS: Oracle, Sybase, SQL Server

ERP: Oracle, SAP, PeopleSoft, Fin, Mfg, HR, SCM, Apps

Lang. & Tools: C/C++, VB, ASP, VB Script, VJ++, ActiveX, COM/DCOM, MFC, Win32, MTS, ODBC, ADO, Access, Java, Java Script, Java Beans, JDBC, JFC, HTML, CGI, Perl, Designer 2K, Developer 2K, PL/SQL, SQL Plus, SQL* Loader, SQL*Reports, SQL* Forms, SQL*DBA, SQR, Crystal Reports.

Reqmts. MS/BS degree w/ 1 or 2 yr exp in the field. Must be willing to travel to client sites throughout U.S.

We offer competitive salaries & benefits. Please mail, email or fax resume to: Avagna Global Technologies, Inc., HR Dept., 3333 S. Brea Canyon Rd. #113, Diamond Bar, CA 91765. Fax: (909) 594-9806. Email: Jobs@avagnaglobal.com

Software Engineer (multiple openings): Design, develop and implement computer software systems to determine feasibility of design and directs software testing procedures; programming and documentation. Work involves extensive travel and frequent relocation. Must have 6 months of experience in the job offered or as a computer professional as well as six months of experience using 2 of A and 1 of B, or 2 of A and 1 of C, as follows: A) ASP, HTML, CGI, Perl, MTS, IIS, B) Java™, CI, Coldfusion, BroadVision, ATG Dynamo, Net Dynamics, WEB-Sphere, Front Page. Bachelor's degree in one of several limited fields. Computer Sci/Apps, Eng, Chem, Physics or business related field. Salary is $70,000 per/yr, 40 hrs/wk, 9:00-5:00 p.m. Please submit resumes to Ms. Sue Notarmicola, Supervisor, Fayette County Team PA CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513. Reference Job Order No. WEB 169502

SR. SOFTWARE ENGINEER Research, design & dvlp software systems for telecommunications; analyze reqts.; consult w/ engineering staff; dvlp testing procedures. BS Computer Science, Engineering or equiv + 2 yrs exp in job or as Programmer/Analyst Exp w/ UNIX, DOS, T1, ISDN, E1, C, FoxPro, 8086 Assembly, Codebase SDK, Dialogic SDK & Network & Voice Resource Board reqd. $79K/yr. Send resume to: H.R. Mgr., Plek Holdings, Inc., 3399 Peachtree Rd. NE, Ste 600, Atlanta, GA 30026. Ref #MC

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Fear of six-figure lawsuits has companies racing to monitor their employees' e-mail and Internet use. But experts say the best defense starts with an explicit privacy and usage policy. We tell you why you need one and how to craft it. *Go to* **www.computerworld.com/roi** *for the story.*

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COVER PHOTOGRAPH: MARK HOOPER

TAKING STOCK

THERE'S A SCENE IN THE 1940 MUSICAL *Babes in Arms* in which 18-year-old Judy Garland turns to her co-star, a cash-strapped Mickey Rooney, with her one good idea for raising some much needed money. "Come on, kids, let's put on a show!" Garland sings. ■ In the Internet economy's opening act, plenty of companies applied the same kind of idealistic thinking to their technology investments, particularly Web commerce initiatives. The greater the number of showy bells and whistles on a site, the thinking went, the greater the number of glitz-hungry customers who would show up to click and buy. Sales and efficiency rates would soar, costs would decline sharply and companies would tap-dance their way to greater profitability. ■ Cut! ■ The script has changed dramatically. Now it's Act 2. Daydreams are out. Discipline is in. Today, smart organizations, such as ING Americas and the U.S. Department of Housing and Urban Development, are applying the same kind of financial scrutiny to technology projects that they apply to other capital-intensive investments, writes Robert L. Scheier in our cover story about calculating and auditing IT project risks and rewards (*page 16*). The payoff for some firms is savings of millions of dollars per year. ■ Discipline is also a requirement for companies racing to develop Internet and e-mail monitoring software as a means of enforcing privacy policies. As companies expand globally, they must also continually track and implement the regulations of other countries, whose privacy laws, like those of the U.S., are ever-changing (*www.computerworld.com/roi*). ■ And the script isn't the only thing changing. There's also a chorus line of new and unproven technology players. In this issue, columnist Gus Tai offers tips on how to increase your odds of choosing a rising star (*page 30*). ■ Also, in an exclusive interview with *Computerworld* Editor in Chief Maryfran Johnson, The Research Board's executive director, Peter Sole, tells of how companies are shifting their measurement focus from simple cost cutting to concentrate on speed, agility and innovation (*page 24*). ■ These are just a few of the highlights you'll find in this issue of *ROI*, where bottom-line thinking about technology aims to help you deliver more than short-term showmanship. The goal is a major hit with a very long run.

— *Julia King*

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TOP LINE

TIPS, TACTICS AND TIMELY INFO ABOUT TECHNOLOGY PAYBACK

touchy issue

Biometrics' Bubble Bursts

BIG-NAME VENDORS SUCH AS MICROSOFT Corp. and Dell Computer Corp. have zealously endorsed biometric authentication keyboard devices that capture a fingerprint scan to identify users before they can get into a system. But don't buy the hype, says Cambridge, Mass., research firm Forrester Research Inc., because this is still early-adopter technology. It will be another three years before user experience and the technology are mature enough for effective implementations, says analyst Frank Prince.

For one thing, the fingerprint readers are at least 25% more expensive than smart-card readers. And both are more expensive than passwords, which don't need special hardware.

It will take until 2003 for the ROI of biometrics to become clear, Prince says. Also, "when those consumers realize that digital fingerprints leave trails that can be used in court, a privacy firestorm will ensue," he says.

cybrarians

Office Libraries Check Out

WITH SO MUCH INFORMATION AVAILABLE for free on the Internet, is your corporate information center — an office of librarians who buy high-priced content — really worth it?

The answer is an overwhelming yes, according to Outsell Inc., a firm in Burlingame, Calif., that studies the information industry.

Outsell's analysis of data from 4,700 respondents showed that when corporate end users got beneficial data from their information centers, they either boosted revenues by an average of $801,585, cut costs by an average of $2,549 or saved an average of 12 hours.

"The lesson here is not that every interaction with the corporate library is a moneymaker or a dollar-saver, but when people do turn to the library to support their decisions, quite often, a lot of money is on the line," says Outsell researcher Mary Corcoran.

use it or lose it

Clicking With Customers

Forget fancy electronic wish lists and e-mail gift reminders. The Web site bells and whistles that online buyers use most often are:

1. Close-up images of products
2. Stock availability information
3. Product comparison reviews
4. A search function
5. A toll-free number for customer service

Source: PricewaterhouseCoopers, Columbus, Ohio
Base: 543 online shoppers

COMPILED BY MITCH BETTS

ILLUSTRATION: DUNG HUANG

dynamic pricing

Railroads Take Cue From Airlines

YOU KNOW ABOUT YIELD MANAGEment, even if you don't know the term. It's how sophisticated computer programs allow the airlines to charge different rates for seats (depending on the laws of supply and demand) to optimize revenue. Yield management has already spread to the hotel industry, and according to Mercer Management Consulting Inc., it should become an important force in the railroad industry, too.

Railroads are losing market share to truck competition and have already milked the cost efficiencies from deregulation and mergers, says Gilles Roucolle, a Montreal-based Mercer consultant. "There is a great opportunity for railroads to now shift their attention to grow the revenue line profitably," Roucolle says. And that means revenue-enhancing technologies such as demand forecasting, business intelligence and dynamic pricing.

But pricing isn't the only area that needs improvement. Corporate transportation and logistics managers — the rail industry's biggest customers — still look for the cheapest price on their freight bills, but they're also interested in value-added logistics services, on-time performance and transit time. "The customer equation is getting increasingly complex," Roucolle says.

In the past 20 years, the four Class A railroads have saved $20 billion through consolidation. They've passed 80% of that on to customers as rate cuts.

talking heads

"The world's total production of information amounts to about 250 megabytes for each man, woman and child on Earth. It is clear that we are all drowning in a sea of information. The challenge is to learn to swim in that sea, rather than drown in it."

— PETER LYMAN AND HAL R. VARIAN
(*www.sims.berkeley.edu/how-much-info/*)

10

the list
Barriers To Mobile E-Commerce

1. **Narrow bandwidth means slow downloads.**
2. **Small screens with tiny keypads.**
3. **Batteries run out (especially for color devices with big screens).**
4. **Dead cells, bad reception and opposition to cellular towers.**
5. **Lack of standards.**
6. **Security and privacy.**
7. **Expensive infrastructure and skimpy revenue.**
8. **Limited applications. Beyond checking scores, stocks and the weather, what else is there?**
9. **Distractions. Sometimes you have to look at the road or watch where you're walking.**
10. **Customers are turned off by the gap between hype and reality.**

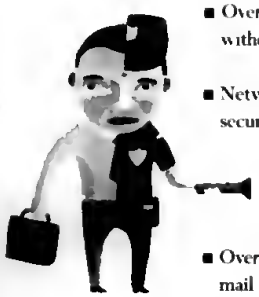
Source: Giga Information Group Inc., Cambridge, Mass.

PHOTOGRAPH: VITO ALUIA

network oops

All-Too-Common Security Flaws

JIM WILLIAMS, A FORMER FBI SPECIAL AGENT WHO investigated network break-ins, says he's worried that any downturn in the economy will lead to cutbacks in corporate security. That would be a big mistake, says Williams, now a consultant at S3 Networks LLC, a professional services firm in Oakbrook Terrace, Ill. He cites the following hidden security traps:



- Overdependence on firewalls or other products, without monitoring the network for intrusions.
- Network administrators pulling double duty as security managers. They just don't have the time or skills.
- Lack of companywide security training.
- Overlooking security on telephone switches, voice mail and modem banks.

calling home

Setting Up Shop in Small-Town U.S.A.

LOOKING TO BUILD A NEW CALL CENTER TO HANdle phone and online customer contacts? Sure, you could do it in popular big cities such as Dallas, Chicago or St. Louis. But consider building in some unlikely places to tap into the labor pool of small-town America, suggests Andy Shapiro, a location consultant at Deloitte & Touche Fantus in New York.

More and more call centers are sprouting up in towns like Stevens Point, Wis.; Marquette, Mich.; and Rockland, Maine. Companies that enter the market early enough "are finding that they can become the 'employer of choice' in these small communities," Shapiro says. The next wave, he adds, may blossom along the U.S. border with Mexico — from Pharr, Texas, to Sierra Vista, Ariz. — as companies seek access "to one of the few remaining pools of available, low-cost labor in North America."

Research Data Design Inc. recently opened a bilingual call center in Las Cruces, N.M. And Tele-Servicing Innovations Inc. has opened a series of call centers stretching across rural Idaho. The latest one is in a former hardware store on Main Street in Jerome, Idaho, population 7,000.

What percentage of [illegible] operating budget is personnel-related?			
50 - 59	131	26.7
60 - 69	125	25.5
70 - 79	122	24.8
80 - 89	81	16.5
Over 90	32	6.5

heads up

The CEO Agenda

Top CEO issues, in order of importance:

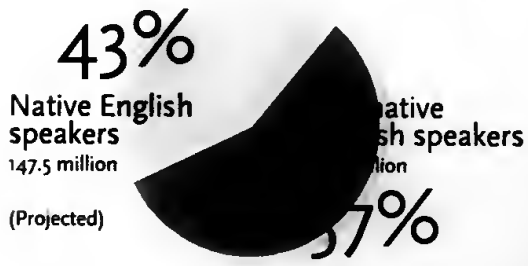
1. Increasing profitability
2. Business growth
3. E-commerce
4. Improving IT performance
5. Strategic/cultural change
6. Mergers and acquisitions

Source: Compass America Inc., Reston, Va., 2000 survey of 412 global CEOs

ILLUSTRATION: AARON MENSHON, PHOTOGRAPH: SEAN SANTOS/IMAGE BANK

are you ready?

By 2005, more than half of the Internet's users won't be native speakers of English.



Source: Computer Economics Inc., Carlsbad, Calif.

resource alert

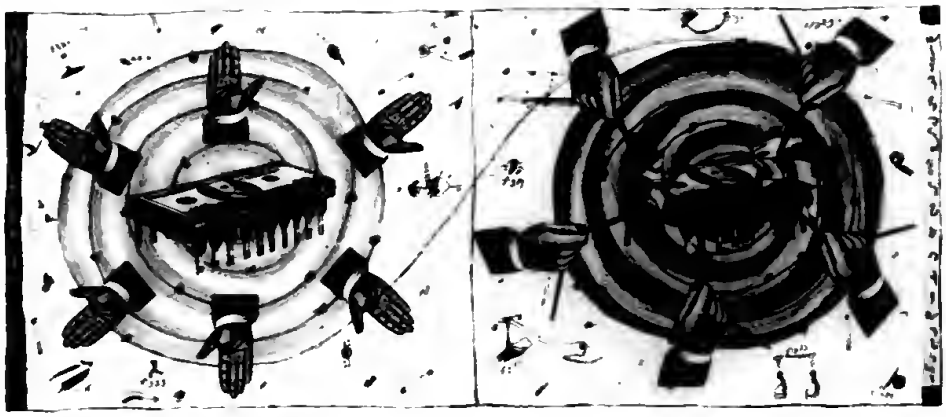
Web Sites for Busy Executives

CEO EXPRESS (*www.ceoexpress.com*): A business portal created for CEOs.

MEANSBUSINESS.COM (*www.meansbusiness.com*): A unique database of more than 20,000 key ideas from business and management books. Try the free newsletter.

KNOWLEDGE@WHARTON (*http://knowledge.wharton.upenn.edu*): The latest business and management insights from The Wharton School at the University of Pennsylvania.

"THE RAPIDLY CHANGING FACE OF COMPUTING" (*www.compaq.com/rcfoc*): An eye-opening, accessible newsletter about technology innovations. It's weekly, and it's free.



BY THORNTON A. MAY

Return on Rebellion

A revolt won business a hand in IT spending. Now, the front line is the future

In French, "roi" means "king." Yet "return on investment" — that technique designed to allow non-IT people to evaluate the relative worth of IT projects — isn't a noble or particularly effective undertaking, especially as currently practiced.

Business people have always been interested in how IT dollars actually get spent. A former chairman at a major Detroit auto manufacturer was rumored to have said, "If I had all the money we spent on IT back, I could have bought Toyota and Honda." So those cavalier "Let them eat cake" days when IT executives delivered what they wanted, when they wanted, independent of business needs, are behind us.

The pendulum has swung from IT as ruling monarch of how money gets spent to IT as puppet to the whim of an unruly mob of business people, blindly giving out everything that's asked for. Of course, we all know that any resource allocation technique must reflect the needs of the business. Jim Griffin, former director of IT at Geffen Records (part of Interscope Records Inc. in Santa Monica, Calif.) and currently CEO at Cherry Lane Digital LLC, is famous for oversimplifying IT resource allocation to its political base elements. As he puts it, "If your budget is getting cut, it's because you are having lunch with the wrong people."

Today, we find our companies on the cusp of making critical infrastructure investments that will drive the economics of information management and support (or not support) their relationships with suppliers and customers. Painter Jackson Pollock told us, "Each age finds its own technique." Senior management teams must now develop their own techniques to greenlight IT expenditures.

New techniques of financial behavior are desperately needed in the areas of security, data and privacy protection, where IT investment techniques tend to be reactive. Budget requests are denied until an incident occurs. The bottom line, quite literally, is that we are doing it wrong.

General Electric Co. CEO Jack Welch, speaking to financial analysts recently, explained that despite the softening in the economy, the investment community wouldn't see "one ounce of slowdown in technology spending" at GE. Rather, he said, "This is the moment to widen the gap."

One way your company can widen that gap is by looking at not only how much you spend, but also how you make spending decisions. Financial techniques of the past funded technology initiatives by focusing on managing the business rather than creating what the business will become. We invested in technologies that solved today's problems rather than the problems of tomorrow. The true revolution will occur when we focus on the future instead of the past. ROI

ILLUSTRATION: YUMI HEO

Visual IP InSight for [illegible]

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SPINNING THE STREET

BY PIMM FOX

Wall Street's New Darling

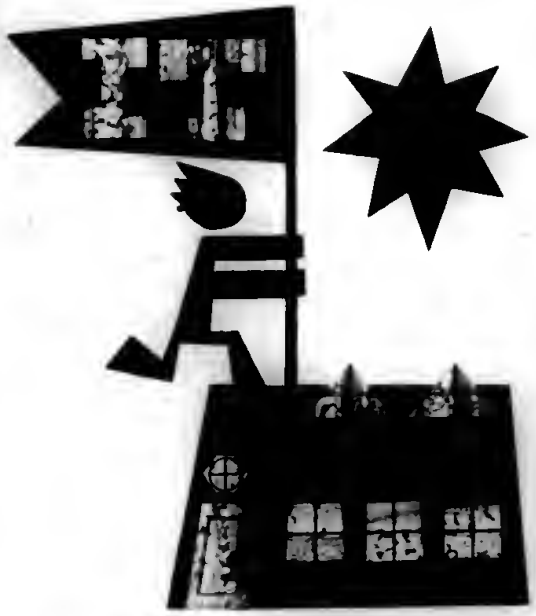
Smart companies are talking up their IT initiatives to win investors

PROFESSIONAL FINANCIERS AND INDIVIDUAL INVESTORS use many measures to decide whether to back a company. Some stare at charts; others read annual reports or talk to senior management.

But increasingly, they're all getting the same message: IT is a key component of a company's value.

"What you are seeing is companies using supply-chain management and cost reduction because it is demonstrable to investors," says Peter Sealey, a professor of marketing at the University of California at Berkeley. That's because using IT to take two or three percentage points out of the cost structure of an auto plant or grocery store chain is something Wall Street analysts understand, he says.

Other companies are following suit. For example, major airlines are touting their technology investments in hopes of being rewarded with stock values similar to those of high-tech companies like Microsoft Corp., Sealey says.



Other brick-and-mortar firms are showcasing their IT as a way of countering dot-coms. "Fortune 500 companies are looking at the incredible multiples these technology-driven companies command on Wall Street and saying, 'We own the assets. We want some of that, too,' " Sealey says.

But such IT showcasing represents a distinct about-face for nontechnology companies, which traditionally have been tight-lipped about their IT strategy and operations.

Fortune 500 companies used to view their IT information as proprietary, but with the success of companies such as Wal-Mart and General Electric, senior management teams now see IT as a part of the value story they must communicate, says one Silicon Valley venture capitalist. Wall Street analysts and investors now want to hear about e-business strategies and what companies are doing with IT to tighten relationships with trading partners, he says.

This emphasis could be a generational shift. "We have the first president of the U.S. with an MBA, and companies have managers who have grown up with technology. They understand the PC and how it changes productivity," says Sealey. "Heck, you even have Jack Welch, GE's CEO, telling Wall Street that IT is instrumental in creating value."

But William Mahoney, executive editor of *Shareholder Value*, a Philadelphia-based investment publication, says he sees corporate trumpeting of IT as part of an overall trend toward more informed investors. "The fact that nontech companies are focusing on technology isn't the issue. The whole notion here is to provide valuable information to the stock market in terms of what drives a company's value," Mahoney says. "The mind-set now is that the more the investment community knows about strategy and key programs — the value drivers — the better."

But playing up IT doesn't always work. "Growing top-line revenue and bottom-line earnings are what matter," he says. "Professional investors have pretty sophisticated methods for predicting a company's future results and aren't moved by billboards or ads that broadcast a company's IT."

Yet despite IT's open-ended role in making firms more competitive, expect to hear more of them trumpeting their IT advances. After all, it beats talking about layoffs. ROI

ILLUSTRATION: PHILIP ANDERSON

Over 30% of web surfing at work is *not* Business Related.*

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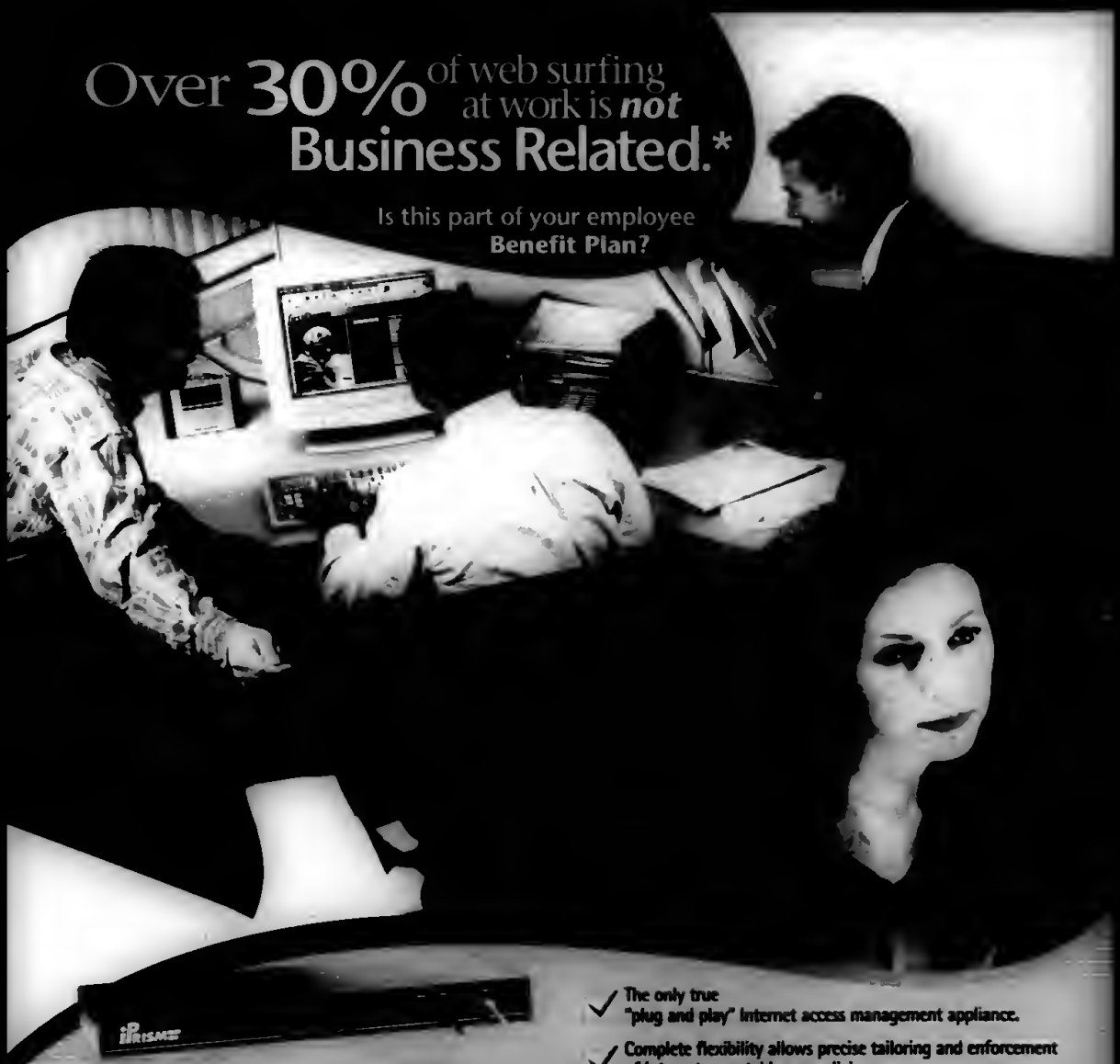

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Stabilizing YOUR RISK

Need to control your unbalanced, runaway or underperforming IT projects? Try looking at them as a portfolio of investments — and let the projects that don't pass these three payback tests take a fall

BY ROBERT L. SCHEIER

QUICK RIDDLE: WHAT'S THE DIFFERENCE between a 250,000-square-foot warehouse in Singapore, an upgrade to your firm's Web site and 10,000 shares in Genentech?

The answer: Nothing. They're all investments you make after weighing their risks and returns. As conditions change, you buy, sell or hold to get the overall rate of return you seek.

Except, of course, when it comes to computer systems. Executives intimidated by technical mumbo jumbo don't ask tough questions about deadlines, deliverables and costs. Technical staffs don't factor in the costs of long-term training, maintenance and support.

And because information technology is somehow "different," IT projects are rarely audited to see if they deliver the financial benefits they promised.

Result: When the true costs are added up, as many as 80% of technology projects actually cost more money than they return, says Firoz Dosani, vice president of Mercer Management Consulting Inc. in Atlanta. "It's not done intentionally," he says, "but the reality is, the costs are always underestimated and the benefits are always overestimated."

PHOTOGRAPHS BY MARK HOOPER

Windows 2000 ADVANTAGE

The Web Magazine for IT Leaders Implementing Windows 2000 and Windows NT with Compaq Services and Solutions

Online this week:

POINT OF VIEW

Agility

As applied to the computer industry, the concept of agility takes on a new meaning. Working together, Compaq and Microsoft are constantly striving to embody that concept.
www.windows2000advantage.com/pov/03-19-01_agility.asp

TECH EDGE

The alleged Active Directory security flaw

It was reported that Microsoft Windows 2000 Active Directory had a security problem relating to the loss of certain group information.
www.windows2000advantage.com/tech_edge/03-12-01_visual_studio.asp

Q & A

Compaq server exec reviews market trends

Hugh Jenkins, director of marketing for Compaq s Industry Standard Server Group, discusses what users espect from their servers.
www.windows2000advantage.com/qa/03-05-01_market_trends.asp

COLUMNS

Defining enterprise class: Is Windows 2000 ready?

Many different elements comprise true enterprise class computing. Ta determine if Windows 2000 fits this elusive bill, Aberdeen Group s Tom Manter takes e detailed look.
www.windows2000advantage.com/columns/04-02-01_enterprise_class.asp

CASE STUDIES

RadioShack, Starbucks blazing Commerce Server 2000 trail

Before Microsoft s Commerce Server 2000 hit the street, it went through an extended beta testing trial with top-tier companies: RadioShack.com and Starbucks.
www.windows2000advantage.com/case_studies/01-22-01_commerce.asp

COLUMNS >

Don't blame me, I'm only the opereting system

Tima after time, the feilure to communicata business goals and tha misuse of information is blamed on tha operating system. In his debut column, Chris Koontz axemines why these feiiures occur and makes recommendations for avoiding them.

For the full story, visit: www.windows2000advantage.com/columns/04-23-01_os.asp

Q&A >

Chris Koontz shares his in-the-trenches experience

New Wmdows 2000 Advantage columnist Chris Koontz is E-business Practica manager, Perks & Company, an a-business end technology consulting firm located in Charlotte, N.C. In this position, he hes gained e wealth of first-hand knowledge while working intimataly with multipla clients on Microsoft Windows 2000 implamantation projects. In this interview, he shares that knowledga with axecutive editor, Windows2000Advantage, Bruca Hoard.

For the full story, visit: www.windows2000advantaga.com/qa/04-23-01_koontz.asp

FEATURES >

Windows 2000 ships with key middleware tools for linking, managing distributed applications

With Windows 2000, Microsoft hes for the first tima bundled meny middlawara capabilities into the operating system itself as tightly integreted epplicetion services, dramatically increesing their performance, reliebility and managaability while cutting costs for customers.

For the full story, visit: www.windows2000advantage.com/features/04-16-01_key_middleware.asp

www.Windows2000Advantage.com/300

CASE STUDY ›

Ebone Streaming Media Service Showcases Windows 2000 and Windows Media Services in a Compaq Environment

Streaming media services delivered via the Internet are an increasingly powerful business resource for conducting live meetings, distributing promotional and collateral video, and communicating with employees and staff around the world. This past fall, Ebone, Europe s original and most experienced data-only broadband optical and IP networking company, entered into an agreement with Microsoft and Compaq to debut the Ebone Streaming Media Service across Europe using Microsoft Windows Media Services operating under Windows 2000 on Compaq servers.

Formerly known as GTS Broadband Services, Ebone is using its expansive fiber-optic Internet backbone to offer streaming media services to the 14 countries and 38 cities that its 12,500-mile European network currently serves. Ebone also links more than 25% of all Internet users in Europe and nearly 10% of all global IP routes. The network is directly connected to North America via Ebone s own trans-Atlantic fiber-optic cable, which is expected to be operational in the first half of 2001.

Ebone s end-to-end service, enabled by its partnership with Compaq and Microsoft, removes the customer s need to manage the hardware and software requirements of a complex streaming media network. It does this by merging optimized server technologies with dedicated, in-house technical expertise.

The Compaq-Microsoft partnership has played a key role in enabling Ebone to offer data encoding, asset management, digital rights management, scheduling, publishing management and technology consulting services all from a single source.

For the full story, visit: www.windows2000advantage.com/case_studies/04-23-01_ebone.asp

QUOTE OF THE WEEK ›

"The Windows 2000 tools we have, such as BizTalk Server, have allowed us to seamlessly integrate into the Sun Solaris-Oracle solution our fulfillment partner uses."

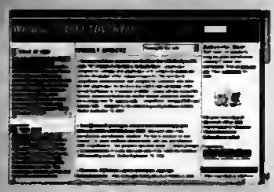
— Mark Sundt
chief technology officer
Haystack Toy Co.

What is Windows 2000 Advantage?

The mission of Windows 2000 Advantage is to become your primary source of timely, useful information for planning and implementing Microsoft Windows 2000 on Compaq solutions and services.

Windows 2000 Advantage is a Web-only magazine because that lets us bring you, the IT leader, great stories that apply to your day-to-day work. We keep you up to date with a weekly e-mail alert so you don t miss a thing.

Windows 2000 Advantage is underwritten by Microsoft and Compaq. Its charter is to address the issues that most concern IT managers charged with keeping their companies on top of the latest and best solutions Microsoft and Compaq have to offer. Toward that goal, we offer a wide range of stories including case studies, columns and news to provide you with information you can find anywhere else.



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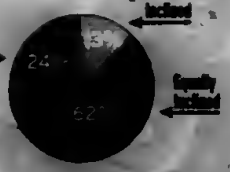

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Microsoft COMPAQ

Produced by: COMPUTERWORLD

Rather than trying to calculate specific returns on each project, some companies are saving millions of dollars each year through a portfolio approach to IT spending. They look at their investments in IT — hardware, software and services such as training — as if they were a collection of retirement investments. Some, such as stock in a start-up, are high risk, high-return. Others, such as U.S. Treasury bonds, are lower-risk, lower-return.

Within an IT budget, an e-commerce project may be a high-risk, high-return investment. Infrastructure upgrades such as buying a faster network are lower risk, lower-return. This is critical because as you're evaluating all proposed spending at once, it's easier to cut redundant projects or those that don't help the company meet its most pressing business needs.

But moving to portfolio management requires firm backing from top management, a strong program office to manage the process, an energetic and committed team to implement the change and a strong analysis methodology.

"The same kind of business discussion you have in other capital projects [such as building a new factory] works well in IT projects, if you just teach the senior management how to ask the same business questions of IT," says Dosani. "What will be the real cash flow impact? What is the real dollar impact if this initiative is successful? And who is committed to [delivering] that increase in revenue, increase in margins or decrease in costs from the business side?" These questions should be answered upfront, he says.

ING Americas, an arm of Netherlands-based ING Group NV, a financial services giant with $386 billion in assets under management at the end of last year, saved $16 million in 1999, the first year it used the portfolio approach, says Steve Stecher, executive vice president and CIO. The unit, which has annual IT costs of about $475 million, achieved those savings by eliminating redundant projects and cutting costs out of others.

For example, ING Americas had three competing projects in IT to allow employees to gain access to multiple applications with a single sign-on. These have now been consolidated.

The portfolio management approach also revealed that several units were looking to upgrade similar applications used for making payments to agents and customers. Not only is ING eliminating some of the competing projects, Stecher says, but it's also looking to use the surviving projects as "centers of excellence" that can share their systems and expertise with the rest of the company.

Even more important, the program office played a key role in merging the IT organizations and systems of companies ING Americas has acquired, such as Aetna Financial Services, Aetna International and ReliaStar Financial Corp. The approach has been so successful that the parent company is considering using it as a model for all its European operations.

The U.S. Department of Housing and Urban Development (HUD) saved close to $36 million in fiscal 2000 and 2001 through an enterprisewide, portfolio-based review of projects that could be consolidated, says Debra Stouffer, deputy CIO in the agency's office of IT reform.

Strong project management offices dedicated to IT portfolio management were key for ING and HUD because they generate the cost, benefits and risk information used to assess individual projects.

It was even more critical for Stecher, who had to help merge the IT units of the acquired companies while creating centralized IT services to be shared by the formerly independent business units. He built an enterprise program management office to avoid the chaos that can accompany such ambitious mergers.

In addition to the usual project management required for all IT initiatives, the program office develops templates, processes and tools for companywide use. But Stouffer warns that tools aren't enough. "You need to come up with policies [and] procedures" for assessing risk and enforcing the assessment process, she says.

Very few companies assess both the

Portfolio Management Requirements

- Firm backing from top management
- A strong program office to develop templates, processes and analysis tools
- Risk/reward analysis methodology and enforcement measures

Three Critical Business Questions That Must Be Answered Upfront

1. What is the real cash flow impact of the IT project?
2. What is the real dollar impact if the IT project is successful?
3. Who specifically is committed to delivering the increase in revenue, increase in margins or other benefits?

cost and benefit of IT projects, says Chip Gliedman, an analyst at Giga Information Group Inc. in Cambridge, Mass. But it can be done without cumbersome bureaucracies or figuring everything to a statistical degree of accuracy. Merely adding the words "as measured by" to a description of a project's benefits goes a long way, he says. If the goal is to improve the performance of salespeople, says Gliedman, their progress could be measured by the number of calls it takes to close a deal.

Dosani says that to "separate the realizable hard benefit from the fluff," challenge the business unit to be accountable for the alleged project benefits. If productivity rises 10% in a department of 100 people, says Dosani, will the business unit "actually lay off 10 staff, or are you going to assign 10 people . . . to a new activity?" Many project sponsors back off their claims at that point, which is a signal to the business managers, also known as the "portfolio managers," that the project is a riskier investment than first thought. The aim of this exercise is to test specific cost/benefit claims for a new project. After finding a bogus claim, business managers can use the technique to test other claims and then change the project, kill it or proceed for other reasons.

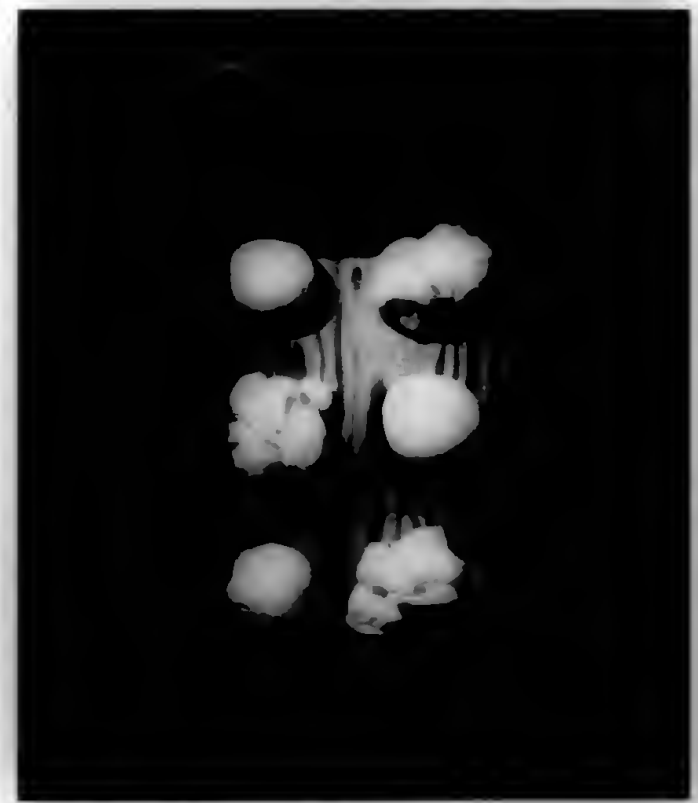
Some companies, such as ING, may develop common metrics for judging all projects. "Whether [the benefit] is in terms of improving operating efficiencies or eliminating positions with automation, we identify those and put in place postmortem reviews to make sure the benefits identified are actually realized," says Stecher. The corporate program office uses these postmortems to improve criteria for evaluating future projects.

Dosani says most IT managers simply underestimate the costs and overestimate the benefits of their projects. Common pitfalls include failing to account for the costs of ongoing training, support and changes to processes needed to make a system work — costs that can add up to five to 10 times the original price.

Once the program office has reasonably accurate cost, benefit and risk data, the fun begins: Who gets the most money and the most control over strategic IT systems?

Both ING and HUD use a multitiered system that filters projects up to a high-level committee made up of business and IT managers. The group meets to review the status of IT projects against the backdrop of changing market conditions, corporate performance and new strategic initiatives. In each case, business managers, not IT managers, play a major, if not final, role in deciding the fate of IT projects.

For the past three years, ING Americas' enterprise program management office has tracked projects costing more



To separate the realizable **hard benefit from the fluff, challenge the business unit** to be accountable for the alleged project benefits. **Kill it, or move ahead.**

Change is difficult. And the **issues get even thornier** when you're **trying to impose** new discipline on managers used to running their **own shows**.

than $500,000, using internal consultants and an IT controller's office to evaluate costs, risks and benefits. After review, projects proceed, with a recommendation from the program management office, to a committee of business unit CEOs who make the final call. Projects less than $500,000 were under the control of business unit CEOs.

Because ING Americas has grown so dramatically, business unit CEOs are getting authority to approve larger projects, says Stecher, although they will still get recommendations from a business unit program management office. Multimillion-dollar projects will still be evaluated by the companywide program management office, for final action by the CEO and CIO of ING Americas.

Infrastructure-related projects that affect multiple business units are reviewed by a council of CIOs from the businesses, which makes recommendations to a CEO council that has the final say.

At HUD, the initial assessment is done by a team that includes staffers representing procurement, the CIO's office and the chief financial officer. From there, the project goes to a working group of the Technical Advisory Board Executive Committee and then to the executive committee itself. That committee, made up of about 20 managers from both the IT and business units within HUD, meets quarterly to decide the fate of projects.

As any manager knows, change is difficult, and senior management has to be ready to enforce the tough decisions. After all, as Stouffer points out, portfolio management "affects who gets what money."

The issues get thornier when you're trying to impose new discipline on managers used to running their own shows. Stecher has eased the way at ING by promoting employees with top IT, project management or change management skills from the firms ING has acquired and making their best tools and processes part of the portfolio management strategy. One example: Stecher plans to adopt a third-party tool used by Aetna to track the resources spent on software development.

Even for the leading adopters, portfolio management is a work in progress. ING is wrestling with how to fast-track critical e-commerce projects while keeping some financial control and ensuring compatibility with other ING systems.

But whatever the challenges, advocates say, well-run portfolio management beats the guesswork returns on questionable projects. Now if they could only do something about those fourth-quarter mutual fund results. **ROI**

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INSIDE THE CIO BRAIN TRUST

THE RESEARCH BOARD IS THE IT COMMUNITY'S PRIVATE THINK TANK. IN THIS RARE INTERVIEW, CEO PETER SOLE TALKS ABOUT WHAT'S ON THE MINDS OF TOP TECH EXECUTIVES

BY MARYFRAN JOHNSON

As CEO of The Research Board Inc., Peter Sole commands the attention of the world's most influential CIOs. The board, which provides research services to the CIOs of 100 leading corporations, is an elite think tank based in New York whose members collectively wield tens of billions of dollars in IT buying power. The board also offers access to computer industry chiefs, who have been known to clear their calendars when summoned.

The board's greatest value, Sole says, is its ability to provide these IT leaders with the "time and space to think, to be challenged and to try out ideas with each other." Sole hails from a CIO background himself, having served as the top technologist at Dixons Group PLC and at Lloyd's, the leading underwriting firm in the U.K. In 1993, Sole founded Wentworth Research, a CIO research service in the U.K. and Hong Kong. Gartner Inc., which now owns The Research Board, acquired Wentworth in 1998. Sole went on to hold senior executive positions at Gartner, including head of research and advisory services in Europe, the Middle East and Africa and head of executive programs worldwide.

In its 30 years, The Research Board has studiously avoided press attention. But in this conversation with *Computerworld* Editor in Chief Maryfran Johnson, Sole discusses the most pressing challenges confronting CIOs at the world's leading corporations.

PHOTOGRAPHS BY BERND AUERS

A COMPANY'S BRAND AND ITS VALUES ARE GOING TO BE SUPPORTED BY THE QUALITY OF ITS INFORMATION SYSTEMS.

ROI: What do you see happening to the role of CIOs as they get more deeply involved with strategic business concerns?

SOLE: Many are not IT specialists. They are businesspeople with IT as part of their portfolio. Typically, they are concerned with not just IT, but other responsibilities like logistics, operations, supply chain, e-business initiatives. Some control venture capital funds set up to develop relationships between their organizations and leading-edge companies. They all sit on the executive committee or the board, and without exception they are seen as one of the [senior management] team. Their key responsibilities are making sure their companies get maximum benefit from IT investment.

ROI: How worried are CIOs about their continually evolving roles in e-business?

SOLE: That's a function of whether they're pursuing these things or being pursued by them. The role of the CIO is about risk and involvement; e-business is no different. The best CIOs are always looking for leverage opportunities around new technologies or software. They keep their eye on the bleeding edge, either by being on it or knowing who's on it. Some have little groups with experimental work ongoing; some visit the venture capitalists. They all have a way of keeping a finger on the pulse.

ROI: There is such an overwhelming amount of information available from multiple sources, though. How do CIOs sift through it all to find value and insight?

SOLE: One of the best things a CIO can do is get the smartest, most experienced people around and compare notes. Ask about the quality of their suppliers or their experience with, say, a particular [enterprise resource planning] system. What we've created [at The Research Board] is an environment of trust, which takes years to establish, where very senior people can deal with quite sensitive things. You have to be certain that your confidences won't be abused, and you'll get something back for what you invest.

ROI: What kind of an impact has all the buzz about the New Economy had on your members?

SOLE: Some people talk about the New Economy, and others talk about the "Now" Economy. I think it's really the "Know" Economy. By that I don't just mean instant gratification, but rather the commercial difference between knowing now and knowing later. It's about removing the uncertainty. Most importantly, you want to remove the time lag, which costs you money. In the Know Economy, you want to know what's going on, and you want to be able to react on the spot, ideally in real time.

It's no accident that the currency markets and equity markets operate in real time, where fractions of a second matter. They are setting the standard for business generally.

ROI: Is it fair to say that return on investment concerns are front and center with CIOs these days?

SOLE: That depends on the culture of the company. Some are very ROI-driven, where every business proposal must have a traditional assessment of ROI. This can be very difficult for major efforts like infrastructure [because] trying to estimate the likely return is very difficult. It's like investing funds in new ventures; it's speculative. It's the judgment around the assumptions that matters.

CIOs are still having to justify projects the way they always did, but I do think we've moved away from cost savings as the

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In 1969, we worked on a SECRET GOVERNMENT PROJECT *that became the Internet.*

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A BRIEF HISTORY

BBN

In 1969, BBN was hired by the U.S. government to develop the ARPAnet, the forerunner of the Internet.

GTE

In 1997, BBN was acquired by GTE, the company that created our high-speed, 17,500-mile Tier1 fiber optic network.

GENUITY

In 2000, GTE Internetworking became an independent company, renaming itself Genuity. Today, we offer a vast array of managed Internet services, including *Black Rocket*™.

GENUITY

classic driver. "Install this, get rid of these people, save money." Those days are gone. What people are much more interested in now is removing friction in the way the company does business . . . sharpening up the supply chain, right from suppliers through to the customer. The big emphasis now is on speed and agility, which of course implies innovation.

The rules of competition change as industries find new ways of doing things. What is making it possible, of course, is the Internet and open standards. It also means our installed base of systems needs a refurbishment. If you have to wait for information about what's happening in your supply chain or your customer base, the longer it takes to react, the more inefficiency you have in your system.

IF ALL CIOs INCREASED THEIR FOCUS OF ATTENTION TO MARKETING AND INNOVATION BY 20%, THAT WOULD BE GREAT.

ROI: Is there such a thing as a system that's too efficient?
SOLE: There can be a downside with efficiency. As we take the slack out, we become more dependent on the system and quality of information in it. It's a creeping dependence. A good example is the supply chain behind the fuel crisis in the U.K. [last year]. It took just four days for the country to come to a grinding halt. The British government had no idea that the supply chain had become so compressed and hence fragile. Once they stopped things up in the supply chain, the whole thing drained out in no time. That can happen to companies. An individual supplier gets into trouble, and if you don't know quickly enough, you're in trouble.

ROI: Does the quality of its IT relate more directly these days to how well a company deals with its customers and suppliers?
SOLE: Increasingly, a company's brand and its values are going to be supported — or detracted from — by the quality of its information systems. If a company is decent, legal, honest and responsive to customers, yet when you phone up no one can tell you where your order is or the right price in your market, or whether you are one of their top customers, then that's inconsistent with the mission and values they're trying to project. The most vivid example of systems being out of line with customer expectations, hence damaging the brand, is the recent presidential election.

Consumer expectations are being driven by best in class. The fact that you're an Old Economy company doesn't make you immune from these competitive pressures. Everything you do is a marketing statement. Every interaction says something about your brand. Customers are getting fed up with organizations that don't know who they are. What is it Peter Drucker said? "Marketing and innovation are everything — the rest is overhead." If every CIO increased his or her focus of attention to marketing and innovation, say by 20% per annum, that would be great.

ROI: Are Research Board members making technology investments to match best of class or to drive the definition of best in class?
SOLE: They don't sit down and say, "Hey, how do we create best in breed?" They sit down and say, "How do we do this much better for our customers? How do we change the way we do business?" I think the most successful companies are focused on what they're doing and not worrying too much about the other guys. They are — all the time — trying to set the pace. They're trying to make their relationship with the customer the best it can be.

ROI: How are they improving those relationships with customers?
SOLE: I see CIOs very active in webifying their businesses and opening systems up to be accessible to customers and suppliers. So they are all heading in the direction of what I call joined-up computing and real-time systems. What I'm also observing is that there's an awful lot more collaboration within industry groups than there used to be. The airlines collaborate like mad, while still competing. So do many others. All these business-to-business exchanges, which must be sponsored and supported by the CIOs, are another example of collaboration. A significant proportion of Board members are personally involved in the creation of exchanges within their industries. It has required them to create some ground rules for this level of collaboration, but because IT is a collaborative kind of business, that does create a framework of trust. Being part of The Research Board, where trust and collaboration are part of the culture, also helps. **ROI**

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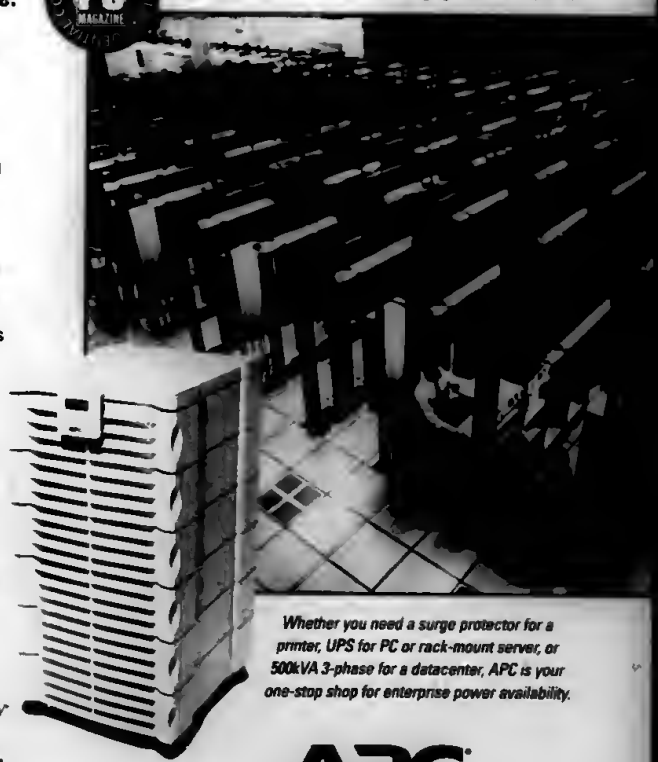

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Betting on Technology Start-ups

Here's how to improve your odds of picking a winner BY GUS TAI

IT'S A DILEMMA EVERY CIO HAS TO CONFRONT sooner or later: stay with your established software vendors, or buy from an unproven start up You know what you're going to get with Oracle, SAP or Microsoft, but buying from them can become another step toward getting locked into a single rigid platform Going with a start up, on the other hand, can help you control your own destiny in today's open computing environment Being the first to have the right technology may also give you a sizable competitive advantage

But in an industry where the failure rate for start ups hovers around 40%, how does a savvy CIO determine when to go with a start up and which ones to bet on? Here are a few guidelines:

FOCUS ON PAIN AND PROFITABILITY. If you're going to take a chance on a start-up, the new vendor should be addressing a major pain point that directly translates into profitability.

For example, in an informal CIO survey my company, Trinity Ventures, recently conducted, roughly three quarters of executives listed "improved storage management" as one of their top three priorities. One CIO said that without the right storage system, his company's IT resources wouldn't scale to match the business' expected 60% revenue growth for that year. Given the lack of alternatives from major vendors, this CIO said any system would provide a large enough incremental benefit to offset the risk of working with a start-up.

For a $1 billion company with a 5% after-tax profit margin, putting the storage framework in place to allow for an additional 1% revenue growth would justify a $1 million initial investment in a start-up product or service.

KNOWING WHETHER TO BE FIRST. The next question is, "What is the cost of delaying the decision?" Here, astute CIOs work as part of the senior strategy team to determine different likely scenarios of market changes and competitive responses

EVALUATE THE ASSETS. If you decide that the benefits of success are large and the cost of delay is great, you now want to focus on minimizing risks At this particular start-up, does senior management have the expertise necessary to get the job done? Has the company attracted strong financial backing? Does it have other customers? Is it willing to craft a contract that has the potential for early wins and early outs? If there are development delays, can you stomach the situation or find alternatives?

If the start-up can't pass this test, you may want to look elsewhere. If it can and you choose to do business with it, be proactive about building a solid relationship.

A key first step is to quickly identify a project manager who has a vested interest in the project's success. You should also be prepared to dedicate internal resources to helping the start-up build the best product for your customers. You'll find that the stronger the relationship, the more influence you'll have in shaping the start-up's long-term strategy, which in turn will lead to long-term benefits for you. **ROI**

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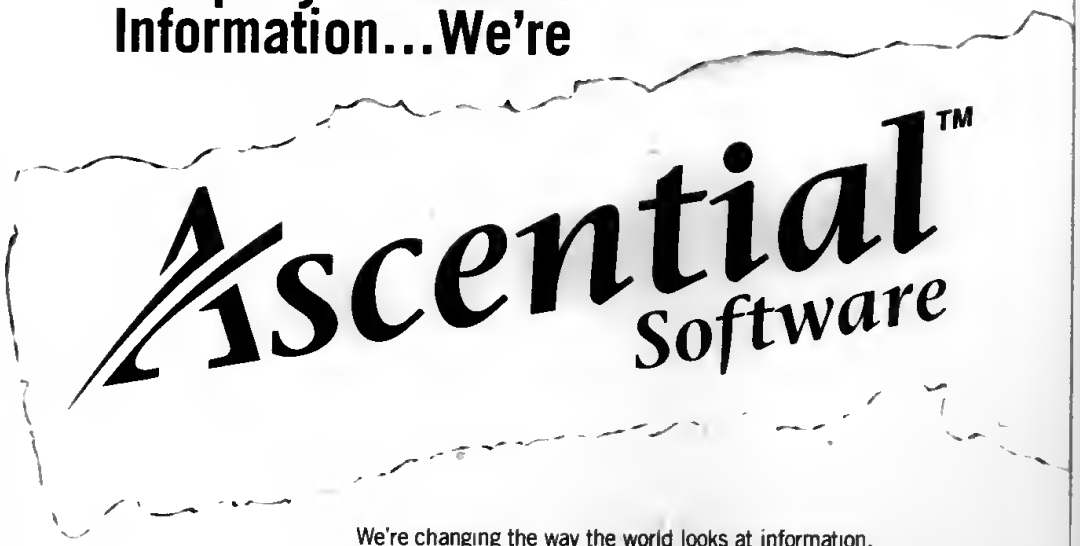

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How to Send Crackers Packing

If blackmailers clip your data, show customers you're a step ahead BY ANN HARRISON

WHEN INTRUDERS LAST YEAR GAINED ACCESS to 3.7 million credit card numbers in its customer database, Internet retailer Egghead.com Inc. took immediate steps against extortion. The Menlo Park, Calif.-based company issued a press release to signal it wouldn't be cowed into silence, reviewed its security procedures and called in law enforcement authorities.

Unlike a previous incident when a cracker stole 300,000 credit card numbers and tried to extort $100,000 from CD Universe Inc., an online retailer in Wallingford, Conn., Egghead said it didn't receive blackmail threats. But the company's swift and strategic response to the security breach paid off with customers, including Ryan Russell, IT manager at SecurityFocus.com in San Mateo, Calif. "It's not that big a deal," he says. "If [Egghead] had been trying to cover it up so it would not lose market share, it would have been much worse. I, as a consumer, am much more willing to forgive an honest mistake than a coverup."

Russell, whose company runs the well-known BugTraq mailing list that posts security bugs, says companies tempted to negotiate with blackmailers are usually most concerned about losing credibility and receiving negative publicity.

But negotiating is a bad idea for several reasons, he says. First, victims can't trust the victimizers with whom they are attempting to negotiate. Second, companies can't trust that an extortionist hasn't passed on stolen information. And finally, companies that have credit card data stolen are obliged to report the theft to the credit card companies, which in turn will cancel the cards and immediately notify users.

Richard Stiennon, an analyst at Gartner Inc. in Stamford, Conn., says extortion attempts would decline if companies refused to cooperate with would-be blackmailers and instead seized the opportunity to spin the story their way. Microsoft Corp. did that last year when an intruder potentially accessed source code for its upcoming operating system release. Microsoft first reported that a cracker had been inside its machines for months but later claimed that the intruder had never accessed the actual product code.

By spinning the story, "you're able to demonstrate to customers and shareholders that not only did you have good security before, but you can respond quickly and plug holes as they occur," says Stiennon.

People who ferret out security holes in commercial software have also been accused of blackmail. But Russell says there's a vast difference between blackmail and disclosure. Blackmail implies financial gain on the part of the blackmailer, he notes, but the only reward for publishing bugs is recognition.

Russell says the harsh light of publicity used to be the only way to get many vendors to plug known security holes. But now, most software companies are more responsive to bug reports. And most bug hunters now give companies at least several weeks to fix a bug before they make flaws public.

Says Russell, "It's getting to the point where the recognition you get if you don't give vendors enough notice is more negative than positive." ROI

ILLUSTRATION: DAVID POHL

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preview

Coming in the July/August Issue:

Partners in Profit

A cereal company teams with a toilet tissue maker to share truck space and transportation costs — and saves millions of dollars a year. The U.S. Postal Service buddies up with rival FedEx to expand its delivery footprint. Want to hold corporate hands? Learn the key role IT plays.

Measure for Measure

Not all companies count the same things. Some figure cost into technology ROI calculations. Some don't. Other metrics-obsessed companies, such as Lockheed and Caterpillar, measure, remeasure and then audit everything, including their own metrics data. Find out what's worth counting and what isn't.

Whatever It Takes

Eastman Chemical has outfitted its low-tech customers with PCs and Web access, invested millions in Internet technology start-ups and launched a Web-based logistics and shipping company. The $5 billion company's e-business czar talks about how these projects are now paying off big-time.

Also Coming in the Next Issue . . .

Why rack up huge capital costs when you can expense hardware and software costs? *ROI* columnist Gus Tai looks at how.

balance sheet

Little Guy Blows By Industry Giants

COMPARED WITH ITS MUCH larger competitors in the $24.9 billion reinsurance industry, New York-based Holborn Corp. is a David among Goliaths. Its high-tech slingshot is a year-old, secure, interactive Web site that enables its client base of large insurance companies to electronically download customized underwriting information — something most of Holborn's competitors still don't offer.

"As a reinsurer, we're the middleman, the broker," says CIO Curt Asbury, "All we have to sell is our expertise and our service." Asbury took a risk on hiring a relatively new but by no means inexperienced consulting company to build and host the Web site, which paid for itself in a little over six months. On an annual basis, Holborn figures it will save $150,000 or more in reduced costs (see figures below) plus increase customer satisfaction levels substantially. To get more details on the risks and rewards of being on the bleeding edge in a stodgy, technology-adverse industry — as well as interviews with Holborn executives, visit *www.computerworld.com/roi* and click on Balance Sheet Notes.

— *Julia King*

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Continued from page 1

Licensing

tened due to dominance in the marketplace," said Scott Newton, a senior technical architect at cookie manufacturer Otis Spunkmeyer Inc. in San Leandro, Calif. "I just hope that I continue to see quality product releases in the future to make me feel like I am getting something for the money."

While industry analysts expect the subscription model to catch on slowly, they also expect customers to experience a greater impact from Microsoft's decision to eliminate its self-described "alphabet soup" of upgrade programs in favor of a less-complicated Software Assurance plan.

"Microsoft will say that it's simplifying, but I would counter that they've confused simplification with elimination of options," said Alexa Bona, an analyst at Stamford, Conn.-based Gartner Inc. Bona said Microsoft has discontinued the "cheap" option — the version-upgrade program her clients commonly use (see chart below).

Under the Software Assurance program, users opting for the new upgrade path will pay 25% of the license fee for any server package and 29% of a desktop product's price each year for the right to upgrade to the latest version of the software available while their agreements are in effect. They must already be using the current version of the software to qualify.

Microsoft officials acknowledged that the change could result in higher prices for some companies, but they estimated that only about 20% of purchases would end up costing more than they do now because those customers upgrade less frequently than average. Microsoft program manager Simon Hughes predicted that "the vast majority of customers will see the cost of license purchases stay the same or decrease over time."

Two analyst firms, however, predicted that the elimination of the popular version-upgrade programs could result in substantial cost increases. Gartner said companies that perform upgrades once every four years could see costs soar 68% to 107% under the Software Assurance program.

"There are some organizations who will find their costs reduced, but it's not going to be, by any means, the majority," Bona predicted.

A company with 5,000 desktops might pay 60% to 90% more for an upgrade of Microsoft's Office productivity software than it does today, Bona said. Instead of paying $900,000 for the upgrade, the company might shell out $1.7 million, she estimated.

Chris Le Tocq, an analyst at Guernsey Research in Los Altos, Calif., said companies that perform Office upgrades every three years will face price increases ranging from 22% to 48%. If they now upgrade every four years, the cost increases could be as much as 40% to 70%, he said.

Companies that upgrade every two years should see costs decrease 1% to 19%, but "in general, that's not something most organizations do," Le Tocq said.

"More and more organizations are telling [Microsoft] they're going to upgrade less and less often," he added.

Come Oct. 1, customers will have four upgrade options: the purchase of a perpetual license, the Software Assurance program, an Enterprise Agreement or the new Enterprise Agreement Subscription model.

"It looks like the [customers] that will be hit hardest are the ones who have stayed back several generations of software and will now have to become current," said Rob Enderle, an analyst at Cambridge, Mass.-based Giga Information Group.

So far, the subscription alternative is drawing some mixed reaction. Jim Prevo, vice president and CIO at Waterbury, Vt.-based Green Mountain Coffee Inc., said it could be difficult for businesses that look at their software purchases as major capital expenditures. When economic times are difficult, companies that put off capital purchases will be forced to ante up if their licenses are about to expire, removing flexibility, he said.

Another drawback is that users would lose the existing option of skipping certain upgrades if they don't want them, he said. Green Mountain chose not to upgrade to Office 97 because of file compatibility issues and other concerns, opting instead to upgrade from Office 95 to Office 2000, he said.

But, Prevo added, "if the price is right, [subscription licensing] wouldn't be bad. I'd have to think about it."

Bona predicted that many companies won't bite, at least initially. "It would appear that their subscription is going to be priced at 85% of the cost of the perpetual license enterprise agreement, and I don't think that price point will be attractive enough for the majority of organizations right now," she said.

Dwight Davis, an analyst at Summit Strategies Inc. in Boston, said Microsoft doesn't have the wherewithal to force the market into the subscription model anytime soon. "The operative model is the perpetual licensing model," Davis said. "People will shift away from that over only a very gradual period of time."

What Analysts Are Saying

"The majority of organizations that I speak to, I would be advising them to analyze the costs over the entire period the products will be installed. And right now, it looks like the break-even point on an enterprise agreement subscription vs. the normal perpetual license is between five and six years."

– Alexa Bona, Gartner Inc., Stamford, Conn.

"Microsoft licensing has always been incredibly confusing. Their stated purpose with these revisions is to simplify the programs and make them more consistent in terms of pricing and licensing terms. From what I can tell, they have made progress. But it still would be a stretch to say they'll be simple under the new programs."

– Dwight Davis, Summit Strategies Inc., Boston

MOREONLINE

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www.computerworld.com/community/os

CURRENT

- **Version Upgrade Program:** For customers upgrading from a prior version in the same product family. Example: Windows NT 4 to Windows 2000 Professional
- **Product Upgrade Program:** For customers upgrading from a prior version in a different product family. Example: Windows 98 to Windows 2000 Professional
- **Competitive Upgrade Program:** For customers upgrading from a competing product. Example: OS2 to Windows
- **Language Upgrade Program:** For customers who need multilanguage versions. Example: Windows 2000 Professional
- **Upgrade Advantage:** Gives customers with eligible prior product version an upgrade to new version and access to all upgrades within contract time frame. Example: Office 97 to Office 2000 and then Office XP
- **Enterprise Agreement:** Gives customers all upgrades within contract time frame
- **Perpetual license:** Gives rights to specific product version

EFFECTIVE OCT. 1

- **Software Assurance:** Entitles a customer to receive the latest version of a product while the agreement is in effect; available to Open and Select license holders who have the current software version. Annual cost is 25% of license fee for the server package and 29% of a desktop product's price. Users must declare intention to participate in the program when software is licensed.
- **Enterprise Agreement**
- **Enterprise Agreement Subscription**
- **Perpetual license/Windows 2000 Professional license:** Customer can purchase new perpetual license for product. Because customer has full Windows license for PCs bought through OEMs, the customer can purchase upgrade license for the Windows desktop operating system.

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FRANK HAYES/FRANKLY SPEAKING

Re-up or Remove

THE BUMPER STICKER READS, "Don't laugh — it's paid for." The car it's attached to isn't the newest or nicest in the parking lot, but it's good enough for somebody. And you can be pretty sure that it costs less to keep that clunker running for six months than one car payment.

That's Microsoft's problem these days. Upgrades are down. Many customers have found a version of Windows or Office that's good enough. It's not the prettiest or most current, but that clunker does the job. There's no compelling reason to upgrade, so they don't.

Microsoft's solution: Compel them.

Aw, that's too strong. What Microsoft is really doing is offering to buy out the "perpetual license" clause in many existing volume contracts (see story, Page One). Under current deals, once the agreement expires, the customer can keep using the software forever. Microsoft wants to change that clause so that when the contract expires, customers must either re-up or remove the software.

Don Young, an analyst at UBS Warburg, says he has already turned up several Microsoft contracts with large European customers that have the "re-up or remove" clauses written into them. Under the new terms, customers must upgrade to the latest versions to renew their agreements.

So what? Well, at companies that upgrade pretty much in lock step with Microsoft, it's no big deal. They're already running the latest and greatest. Or they're six months behind the latest and greatest but still upgrading regularly.

But for companies that have found a good enough version of, say, Office and jumped off the upgrade treadmill — you know who you are — the new clause forces you right back on it.

The irony is, it's a mark of Microsoft's success that so many customers have stopped upgrading.

Time was, upgrading desktop software wasn't a choice; it was a matter of survival. The features weren't there; the bugs were. Every new version edged a little closer to good enough, but it was never quite right.

But Microsoft finally delivered the goods — or good enough, anyway. Today, there's plenty of copies of outdated Windows and Office out there just chugging along. At long last, they're mature, stable and working fine.

And like that eyesore in the parking lot, this old software is a known quantity. Its bugs and quirks are familiar to both IT and users. You know how to work around problems and squeeze out the capabilities you need. Besides, it's paid for. Why upgrade?

That's a question only Microsoft can answer. Those new terms will effectively eliminate the choice not to upgrade. That means Microsoft's answer had better be pretty impressive.

Microsoft's new terms will eliminate the choice not to upgrade.

So when Microsoft comes calling to buy out your perpetual license clause, do the math. Calculate the real cost of all those extra upgrades you'll be forced to do — including the labor, the learning curve, the applications that break and the hardware that turns out to be inadequate.

Figure in what the lost flexibility will mean at budget time — you'll no longer have the flexibility to put off upgrades when times get tight. It's one more chunk of your budget that's out of your control.

Then listen to how much Microsoft offers to make those extra costs and loss of budget control worth your while. Hey, don't laugh — maybe they'll pay for it.

But don't count on it.

Hayes, Computerworld's senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

WHEELER-DEALER at Fortune very-small-number company spends hours on the phone with the help desk, trying to connect his laptop to the network. Reinstalls, reboots dozens of times, attempts to ping servers all over the network – nothing helps. Non-IT pilot fish walks in on exec and points out that the PC Card network dongle isn't plugged in. He plugs it in; the connection works. "Help desk never asked if the machine was a laptop," fish shrugs.

WANNABE POWER USER with a yen for the latest and greatest orders the newest version of his PC operating system and submits a requisition for installation. Weary (and wary) IT pilot fish e-mails user, asking, "Are all your software tools on your PC certified and tested to run on the new OS version?" Replies user blithely, "How should I know? I'm not even sure what's installed on my PC."

HIGH-POWERED MARKETING MANAGER hears that networking pilot fish is installing a file-share server to support a dozen company divisions. That's not right, manager objects. "An Internet-focused company like ours shouldn't put files on a server," she says. "They really should be on the intranet."

BIGWIG SALES EXEC at digital videoconferencing vendor is interviewing pilot fish for a job, touting how the company is trying to break into the commercial market. Have you pitched cable systems operators? fish asks. "Why would I do that?" baffled bigwig replies. "What would I do with all that bandwidth?"

After last Wednesday's Daily Shark item (you can see it at *computerworld.com/sharky*), one IT director pilot fish had to respond. "When I first got here, I had the team rename the servers," he says. "The server for the GI Lab system was called Uranus. I thought that was . . . unprofessional." Tell me about your profession: **sharky@computerworld.com.** You get a sharp Shark shirt if your true tale of IT life sees print.

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12:00 - 5:00pm
GOLF TOURNAMENT FOR PRE-REGISTERED ATTENDEES

7:00 - 8:30pm
PRE-CONFERENCE EVENING NETWORKING RECEPTION

MONDAY, MAY 21

7:00am - 8:00am
BUFFET BREAKFAST

8:00am

WELCOME & OPENING REMARKS
Alan Guibord, CEO, Computerworld
Maryfran Johnson, Editor-in-Chief, Computerworld

8:15am

OPENING KEYNOTE: GOING DIGITAL THE OLD-FASHIONED WAY: GM'S LEVEL-HEADED APPROACH TO E-BUSINESS
Ralph Szygenda, CIO, General Motors

9:00am
PANEL 1:
IT'S MISSION IMPOSSIBLE: GLOBALIZATION AND E-BUSINESS
Panel Moderator: Sarwar Kashmiri, CEO, EbizChronicles.com

Ready or not, the Web is making the globalization of business a reality. But pursuing a global strategy means more for IT than creating a worldwide network infrastructure, setting up foreign distribution or hiring IT talent abroad. So how does an IT Leader go about getting a grip on strategy to support the enterprise's global business objectives? Our panel will share its collective international experience to send you off with a host of good ideas along with an action-item list.

10:00am
BREAK

10:15am

OLD RULES, NEW GAME: BUILDING PRUDENTIAL'S GLOBAL E-STRATEGY
Irene Dec, VP International Investments, Prudential Insurance

11:00am
PANEL 2:
THE NEXT WAVE OF E-COMMERCE: CONNECTING YOUR CUSTOMER CHANNELS
Panel moderator: Kevin Fogarty, Business & Technology Editor, Computerworld

The customer economy has arrived with a vengeance, trailing massive numbers of Customer Relationship Management (CRM) systems in its wake. But integrating disparate CRM applications and re-architecting workflow to get that mythical 360-degree view of the customer remains a major hurdle for IT. Are you tying all of your customer channels together — in real-time — to leverage existing investments in front-office and legacy applications? This panel will bring together diverse industry views on a topic that ultimately affects every company's bottom line.

12:00pm
INTERACTIVE LUNCH: RECRUITING & RETAINING TOP TALENT

1:30pm

AFTERNOON KEYNOTE: SURVIVING THE REVOLUTION AND THRIVING IN THE CUSTOMER ECONOMY
Patricia Seybold, CEO, Patricia Seybold Group and Author of "Customers.com" and "The Customer Revolution"

2:15pm
PANEL 3:
WIRELESS WARRIORS AND THE CHALLENGE OF M-COMMERCE
Panel moderator: Bob Brewin, Senior Editor, Wireless Technology, Computerworld

Few technologies hold as much promise — or pose as many perils — as wireless networks and mobile computing. What are the best practices in deploying mobile commerce applications that resolve security concerns and location-service controversies? Which applications make the most sense for wireless LANs? How do you choose an architecture that works well for your user base? How solid is the Wireless Application Protocol (WAP) standard for unifying handheld devices and wireless networks? Our panelists will examine these core questions through the lens of their own experience, coming up with some practical recommendations for the next wave of wireless warriors.

3:00pm
BREAK

3:10pm

CLOSING KEYNOTE: THE ABILITY TO RISK INNOVATIONS
Chet Huber, President, OnStar

3:55pm
CLOSING REMARKS

4:00pm - 5:30pm
SPONSOR BREAKOUT SESSIONS

5:30pm - 8:30pm
COCKTAIL/NETWORKING RECEPTION
EXPO & BUFFET DINNER

TUESDAY, MAY 22

7:00am - 8:00am
BUFFET BREAKFAST

8:00am
OPENING REMARKS
Alan Guibord & Maryfran Johnson

8:15am

OPENING KEYNOTE: IT LEADERSHIP IN A CHANGING ECONOMY
Doug Busch, CIO, Intel

9:00am
PANEL 4:
THE HEAVY HAND OF UNCLE SAM IN ONLINE SECURITY AND PRIVACY PROTECTION
Panel Moderator: Alan Paller, Research Director, SANS Institute

Whatever technology touches its citizens these days, the U.S. government seems to be there with new regulations or proposed legislation. The high-tech sector remains split about how to approach online privacy-guarantees in the U.S., while the European Union has already adopted tough data protection laws that multinational companies must follow. Our expert panel will talk about strategies for keeping a step ahead of Uncle Sam in this uncertain, potentially explosive, regulatory environment.

10:00am
BREAK

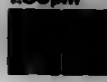
10:15am

PRIVACY - IT'S NOT JUST A COMPLIANCE ISSUE
Eddie Schwartz, VP of Strategy, Guardent (former Chief Security Officer, Nationwide)

11:00am
TOWN HALL MEETING: "ASK THE CAREER EXPERTS"
Maryfran Johnson

12:00pm
EXPO & BUFFET LUNCHEON

1:30pm



AFTERNOON KEYNOTE: THE BEST OF BOTH WORLDS: THE SYNERGY BETWEEN OPERATIONS AND IT
Laura Olle and Margo Connelly, Co-CIOs, Capital One Financial

2:15pm
PANEL 5:
THE NEW ROI: TRACKING TECHNOLOGY PAYBACK IN A TOUGH ECONOMY
Panel Moderator: Julia King, Executive Editor, ComputerworldROI

Now is the time to recession-proof your IT organization, generate some new ideas and find new revenue streams. How is your company using the Internet to streamline processes within the organization and deal more effectively with your supply chain? Are you creating online relationships with partners and competitors alike? Where can you use IT to create new products and services? Getting focused on the real business opportunities and the ROI behind technology expenditures is the mission of this panel.

3:15pm
BREAK

3:25pm

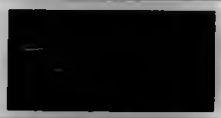
CLOSING KEYNOTE: ESSENTIAL INGREDIENTS FOR B2B MARKETPLACE LIQUIDITY
Harvey Seegers, President/CEO, GE Global eXchange Services

3:55pm
CLOSING REMARKS
Alan Guibord & Maryfran Johnson

4:00 - 5:30pm
SPONSORED BREAKOUT SESSIONS

7:00pm
COCKTAIL RECEPTION, ENTERTAINMENT AND GALA AWARDS DINNER

WESTIN MISSION HILLS RESORT
71333 Dinah Shore Drive
Rancho Mirage, California 92270



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